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ABSTRACT

The overall goal of this exploratory project was to initially uncover factors of variables likely to be involved in the impact of educational products. The specific objectives were to construct systematic case studies of the development of selected educational products as an initial basis for arriving at more precise procedures to assess potential impact; to provide empirical case study data relevant to current hypotheses about innovation and change in public school education; and to prepare a listing of educational products judged, according to specific criteria, as having substantial positive impact. The study included the following activities: 1) the development of initial selection criteria for educational products with impact; 2) the identification and description of products meeting the initial selection criteria; 3) the identification of 21 of those products for intensive review; 4) systematic case studies of the 21 products tracing the history of each from its origin to its diffusion and adoption; 5) the extraction of generalizations about the products based upon product characteristics, development, evaluation, diffusion, adoption requirements, etc. with the generalizations then related to existing hypotheses regarding the processes of innovation and change in education; 6) an identification of ways whereby information on the impact, or potential impact of educational products may be obtained. A 32-item bibliography and appendixes are included. (Author)

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FINAL REPORT

Contract No. OEC-0-70-4892

EVALUATION OF THE IMPACT OF EDUCATIONAL RESEARCH AND DEVELOPMENT PRODUCTS

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Palo Alto, California

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PREFACE

As noted in the text, this document is one of number of reports resulting from the evaluation of the impact of educational research and development products. Available separately are the 21 Product Development Reports listed in Appendix H. Each Product Development Report represents a relatively unique attempt to document what occurred in the development of a recent educational product that appeared to have impact in the nation's schools. Although awareness of the full extent of this study requires reading both the individual Product Development Reports and this final report, each may be read individually.

A number of AIR staff have participated in the study. The permanent project staff, in AIR's Evaluations and Research Program, consisted of: Calvin E. Wright, Principal Investigator; Jack J. Crawford, Project Director; Daniel W. Kratochvil, Associate Project Director; Carolyn A. Morrow, Administrative Assistant; and Sibyl O. Anderson, Administrative Associate. Other staff who assisted in the initial planning activities, site visits, or preparation of the Product Development Reports include: Joan M. Altick; Bonita J. Berger; Steven M. Jung; Yungho Kim; Dewey Lipe; William L. Raley; Barbara A. Sanderson; Lorna J. Thompson; David V. Tiedeman (whose name was inadvertently omitted as a coauthor of Product Development Report No. 11: The Arithmetic Proficiency Training Program); and Robert A. Weisgerber. Both staff and project owe much to the perceptive criticism of Dr. Alice Y. Scates, Project Monitor for the Office of Program Planning and Evaluation.

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INTRODUCTION

Problem

According to the 1969 USOE publication entitled Educational Research and Development in the United States, Office of Education funds spent in support of educational product development since 1957 amount to a total of over \$2 billion.[1] Overall U.S. government support for educational products, roughly defined, during the fiscal year 1968 was over \$91 million. This amount does not include OEO expenditures in the area of instructional system development, which would substantially increase the figure.

Various attempts to measure the results of this investment have been made, such as the works of Getzels (1969) and Cronbach and Suppes (1969). In general, these reports tend to show how significant lines of conclusion-oriented basic inquiry have borne fruit in the overall context of educational practice. It is apparent, however, that most evaluation activities which are connected with the educational research and development process fall under the rubric of decision-oriented or applied inquiry. The nature of these activities, directed primarily toward revising an educational product, makes it extremely difficult to obtain a precise reading of the overall impact of the product. Product impact may be usefully thought of as measurable positive change in student performance on educationally important goals sustained over time. There is an extreme need for valid indicators of such impact.

The primary problem, then, is to begin development of a set of procedures whereby specific evidence of potential product impact may be identified so that an assessment of R&D impact can be made. These procedures could be utilized in future decisions regarding the direction of and support for educational research and development efforts undertaken by USOE. For example, such findings as performance in pilot study or field test situations must be considered as strong indicators of the potential of a product to ultimately produce measurable change in student performance.

The case for using empirical findings from decision-oriented product development research is strengthened when one considers the results of the special 1968-69 study for the Organization for Economic Cooperation and Development commissioned through the Policy Institute of the Syracuse University Research Corporation (USOE, 1969). One of the most interesting outcomes of this study was that 64% of the school superintendents in a national sample gave no response to a question asking for the educational research and development outcomes which have had an influence on American school practice. A secondary problem, then, is to provide information which will allow USOE to effectively coordinate the dissemination of products which have identified potential for educational impact.

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[1] This includes listed expenditures in the areas of instructional systems, curriculum, computer-managed or assisted instruction, and a combination category which contains the regional laboratory expenditures.

Review of Literature and Relevant Research

The central purposes of the U.S. Office of Education research program have been stated as: the generation of knowledge; the development of validated and economically feasible instructional products; and the dissemination of information that will enable local schools to be aware of and implement the new knowledge and techniques (USOE, 1968).

Various studies have been conducted to explain both the process of relating new knowledge to the development of validated educational products, and the process of insuring that validated products eventually come to have an impact on local school practices. Several examples of both processes will be noted here.

Of historical and methodological significance are studies such as the Department of Defense Project HINDSIGHT (Sherwin and Isensen, 1966), the National Science Foundation Project TRACES (1968), and the National Academy of Sciences report to the House Committee on Science and Astronautics (1967). These studies have sought to identify the principal elements of successful applied research leading to new technology of national importance. All of the reports contain detailed examples of the development of exemplary products and processes. In addition, these studies have indicated certain characteristics of organizations, environments, and personnel which seemed to be indicators of successful research and development projects, and include proposals for more effective application of scientific resources to the solution of national problems. For example, one such project concluded:

1. In all cases studied, nonmission research provided the origins from which science and technology could advance toward the innovations which lay ahead.
2. Of the key events documented, approximately 70% were nonmission research, 20% mission-oriented research, and 10% development and application.
3. The number of nonmission events peaks significantly between the 20th and 30th year prior to an innovation, while mission-oriented research events and those in the development and application area peak during the decade preceding innovation.
4. For the cases studied the average time from the conception to demonstration of an innovation was nine years.
5. Most nonmission research is completed prior to the conception of the innovation to which it will ultimately contribute.
6. Although nonmission and mission-oriented activities regress during the several years just preceding

innovation, it is apparent that the interplay between these types of research activities is important and sometimes even crucial during this terminal period.

7. The presence of interdisciplinary communication is very evident in, and important to, the achievement of innovation.

8. The study points out the need for a better understanding concerning the two-way interaction between science and technology. The tracings revealed cases in which mission-oriented research or development efforts elicited later nonmission research which often was found to be crucial to the ultimate innovation.

9. Innovations for the next generations depend on today's nonmission research. [NSF, 1968, pp. iv-v.]

Against this prologue, it is interesting to note some of the findings of the Committee on Educational Research of the National Academy of Education edited by Lee Cronbach and Patrick Suppes (1969). A similar approach is followed, in that the committee sought to point out current practical manifestations of exemplary lines of conclusion-oriented (basic) inquiry and then went on to formulate a position whereby both research and development can be better integrated into the stream of educational progress. This position is summarized as follows:

> 1) The main function of conclusion-oriented inquiry is to gain a better understanding of some educational process, or of some aspect of the nature of man and society. The research that has the greatest long-term significance is that which produces new concepts, rather than that which attempts to use the delicate apparatus of science to hammer out an immediate solution to a current problem.
>
> 2) An attempt to solve an immediate problem can also capitalize on inquiry, first by using the available knowledge and concepts to work out a sensible plan, second by using direct decision-oriented inquiry to guide day-to-day decisions as the plan is put into practice, and also to determine how well the final scheme works.
>
> 3) The two kinds of inquiry which we have referred to as "conclusion-oriented" and "decision-oriented" are carried out with different time perspectives and often require different techniques. Hence it is important to distinguish the two functions, and to call upon each type of inquiry for the kind of service it can best render. Decision-oriented studies are studies in the service of a decision-maker, and they will be useful only if the decision-maker truly understands what they can contribute and demands that kind of help. Conclusion-oriented studies are generalized, their broad conclusions and new ways of thinking are intellectual resources for educators, scholars, and laymen, but they do not give a pinpointed answer to the problems the decision-maker faces today.

> 4) It is a mistake to press the conclusion-oriented inquirer to arrive at generalizations that the practical educator "can apply." Even in highly technological fields, basic understandings gained through fundamental research are not directly applied; there must be additional conclusion-oriented research to understand the practical problem, and then there must be decision-oriented design studies and try-outs to produce a practical solution for a particular situation. Enlightenment gained from conclusion-oriented studies helps the designer to know what to take into account in his plans and his evaluations, but it never dictates the shape of the practical solution. [Cronback and Suppes, 1969, pp. 266-268].

In the area of dissemination and adoption of educational research and development products, several extensive reviews of the available literature and several comprehensive theoretical models have recently appeared. The report of the Commission for Economic Development has stated the problem ". . . but unless the products of research are disseminated effectively in forms to be usefully employed, the investment is lost" (CED, 1968, p. 29). The authors of the 1969 report on Educational Research and Development in the United States (USOE, 1969), studying in depth the extent of usage of various educational research and development products, concluded that "the overwhelming majority of students get no exposure to most of the newer teaching practices. . . . More than half of the 33,731,000 students included in our projection got no exposure to 13 of the 17 specified innovations [in the project's questionnaire]" (p. 147).

Again it is apparent that the dissemination cycle in the area of the physical sciences may provide a model to education. Phillips (1969) outlines the system through which technology developed by the NASA manned space flight program has found wide application in the bio-medical field. In comparison, models of dissemination and change in education are quite rough. The Clark and Guba research, development, and dissemination paradigm (1965) seems to underlie much of the current policy planning at USOE. However, the model has been criticised on several accounts. For example, Gideonse (1968) points out its failure to account for initiatives of different kinds which may take place at any point on the continuum from research through adoption. Essentially this is a rejection of the "linear" dissemination and utilization model. Kreitlow and MacNeil (1969) among others have proposed a cyclic model for which they have collected some supporting data.

Perhaps the most well-known and well-supported current dissemination model is that of Havelock (1969) who has examined the literature on utilization and adoption at length. He and his associates have proposed a "linkage" model which is a combination of several other paradigms. With regard to this model, it is suggested that "effective knowledge utilization requires a degree of division of labor, coordination, and collaboration throughout the social system. The role of government should be to . . . support, facilitate and coordinate linkage activities so that the total system can function more effectively" (Havelock, 1969). By way of suggesting ways to collect data supporting this paradigm, Havelock suggested that ". . . although there were many quantitative research studies, there was a paucity of case materials. We need more case studies which carefully document and report dissemination and utilization events" (Havelock, 1969, p. 11-2). The research proposed here bears upon this need.

Objectives

The overall goal of this exploratory project was to initially uncover factors or variables likely to be involved in the impact of educational products. Hopefully, the results of the search would then facilitate the eventual development of a more precise system of gauging product impact. Such a system could assist USOE in deciding how to invest R&D funds for product development to obtain maximum impact on our educational system.

The specific objectives of this exploratory study of educational products were:

1. Primarily, to construct systematic case studies of the development of selected educational products as an initial basis for arriving at more precise procedures to assess potential impact.
2. Secondarily, to provide empirical case study data relevant to current hypotheses about innovation and change in public school education.
3. An additional and enabling objective was to prepare a listing of educational products judged, according to specific criteria, as having substantial positive impact.

Approach

This study utilized an approach similar to those which have been used successfully in the physical sciences and which have been advocated by authors in the field of knowledge dissemination and utilization. In effect, this is to carefully identify products which have "made it," that is, have emerged from the research and development cycle to impact with success upon American education. In-depth study of the educational products was undertaken to provide a basis for establishing what features of the products--their origins, their developers, their target populations, their dissemination, the prevailing *Zeitgeist*, etc.--might be identified as common contributors to their eventual impact. Generalizations arising from such study can be used to construct indicators of potential product impact, and to provide evidence relevant to various models of the research, dissemination, and development process. In one sense, then, this study has both applied and basic outcomes.

The study included the following activities:

1. The development of initial selection criteria for educational products with impact.
2. The identification and description of products meeting the initial selection criteria.
3. The identification of approximately 20 of those products for intensive review.
4. Systematic case studies of each product tracing the history of each of the 20 products from its origin to its diffusion and adoption.
5. The extraction of generalizations about the products based upon product characteristics, development, evaluation, diffusion, adoption requirements, etc. The generalizations were then related to existing hypotheses regarding the processes of innovation and change in education.
6. An identification of ways whereby information on the impact, or potential impact, of educational products may be obtained.

METHOD

Development of Initial Selection Criteria

Specific criteria were developed for the selection of educational research and development products that have had substantial positive impact. It was recognized that it is difficult to measure educational impact, which might be defined as sustained, measurable, and desirable change in educational achievement or the factors which directly determine it. Since change in educational achievement is also difficult to measure, one possibility would have been to examine the factors or variables likely to be involved in determining it. It was believed, however, that a crucial criterion for determining educational impact is a demonstrated effectiveness in improving student performance on well-recognized cognitive and/or affective goals. Previous work at the American Institutes for Research (AIR) by Hawkridge et al (1968; 1969), had demonstrated the feasibility of including in studies of exemplary programs only those that have demonstrated statistically significant gains with reference to national norms on standardized tests, or significant gains for enrolled students over control students. It was, therefore, decided that such considerations be included in the criteria for the initial selection of educational products for this study.

It was recognized that restricting the consideration of educational products only to those that have, in fact, demonstrated effectiveness in improving student performance might result in overly restricting the number of products to be considered when simultaneously applied with other criteria covering potential antecedents of demonstrated effectiveness. It was decided, therefore, that demonstrated effectiveness would be considered separately and in addition to other criteria, such as scope of use. Definitions of impact in areas other than educational achievement were also considered. Preliminary work at the American Institutes for Research had, for example, identified some eleven goals considered essential for students in today's schools (Wright, 1970). The degree of attainment of only two of these goals can be estimated by the use of standardized achievement tests.

Initial drafts of the criteria were prepared, discussed, and reviewed by a number of AIR staff. In addition to impact criteria covering scope and effectiveness, definitional criteria were included to distinguish educational products from non-products for the purposes of the study. The effectiveness or effects criteria were stated in terms of "accepted educational goals" so that both cognitive and affective goals would be admissible, and provisions were made for the effects of products whose impact is currently not directly measurable.

The final definitional and impact criteria, as approved by USOE, are given below.

Definitional Criteria

Definitional criteria are those which were applied initially to distinguish educational products from non-products for the purpose of study delimitation. These criteria insured that products were construed as having behavioral as well as physical attributes and as having evolved from empirical research and developmental procedures. While this is an OE supported project, proprietary products as well as products of OE supported projects were considered.

1. *The product should have explicit and well-defined goals and objectives. Or, the product should have implicit objectives of major importance.* Written formulation of goals and/or objectives may appear as statements of purpose or outcome. Goals should relate clearly to some broad conceptual scheme (such as curriculum) or a methodology (such as a teaching-learning technique). Objectives should indicate the target audience, conditions, and anticipated indicators of success.

2. *The product should have procedures and guidelines for its implementation and use. And, the product should specify the texts, equipment, or techniques which are to be employed.* The product may be a discrete "unit" or it may be a complex of things that are seen as integral and coherent.

3. *Systematic data regarding the development and use of the product in the field should be available.* It should be possible to obtain some type of existing systematic data regarding the product's development and use in the field so that the achievement of goals or objectives could be assessed. A high degree of behavioral specificity would be desirable.

Impact Criteria

Impact criteria are those which were applied to determine the importance of the product as a contribution to educational practice. This importance was demonstrated along two dimensions: the scope or magnitude, and the effect or intensity of intended outcomes. These criteria insured that comprehensive products having impact on a large scale, over time, were included and that these products have demonstrable results on the target audience.

1. Scope

    a. *The product must be implemented in one of the following grades: K-1-2-3-4-5-6-7-8-9-10-11-12, and in one of the following areas: language, mathematics, social studies, science, or vocational education.* The product must be implemented at some point within the range of grades and subject matter areas specified above. The product cannot be college level, conducted in private or by correspondence, or preschool when not in association with the school program. Either it involves content in one of the mentioned disciplines or it is a process applicable to these disciplines.

b. *The product must have presently available a full and complete written description in sufficiently definitive form that it can be installed as described.* A "full and complete description" would include information of the type categorized under the heading Definitional Criteria, above.

c. *The product should be in use in at least five schools having no direct connection with the original developers.* The intent of this criteria is to exclude those products that work due primarily to the efforts of one person.

d. *The target population at which the product is aimed should be a substantial one.* "Substantial" was defined as at least a fourth of the total population in U.S. schools at the intended age or grade level.

e. *The product should have been brought to the attention of the educational profession through professional journals, publications, conventions, or other broad dissemination procedures such as marketing techniques.* Reference to the product should exist in the literature in more than one journal at a minimum, and its existence should be "known" by some reasonable proportion of professionals working in the discipline.

f. *The product should have come into use in the schools during the last five years.* A product could be "emerging" at the present time or could have been in existence at any time during the last five years.

2. Effects (the product should meet at least one of the following two conditions).

   a. *The product should have produced results which suggest a measurable gain toward accepted educational goals relative to a specified baseline and these results should be sustained over time.* Measurable gain should be indicated by the results of a controlled experiment in which the norm or starting point for the target audience was given and in which comparative data over time was obtained.

b. *If the product impact is not directly measurable in terms of educational goals, the product should have contributed toward accepted educational goals in at least one of the following areas or facilitating factors: School organizational efficiency, classroom climate or operation, learning procedures or methodology, and improved perceptual-motor skills.* The "areas" listed will, presumably, have a bearing on student development by modifying environment, human interactions, or skills when the product is used. "Learning procedures or methodology" included students learning about themselves or the world of work.

Development of a Product Rating Form and a Product Description Form

To obtain a broad range of products meeting the initial criteria, it was decided to use, as one of a number of strategies described below, nominating panels representing various professions in education, professionals whose experience would enable them to identify products meeting the initial criteria. To economically obtain product nominations from panelists across the United States, mailed nominations were indicated.

The need for a convenient but detailed check list to initially determine whether each product nominated met the criteria for this study led to the development of a Product Rating Form (see Appendix B). The form was designed so that it: would specify all of the definitional and impact criteria presented above; could be quickly filled out; and could be quickly scanned to determine whether products did, in fact, meet the criteria. The form was constrained to one page. The criteria were reduced to simple questions that could usually be answered by either yes, no, or don't know. In the case of grade level implemented, content area, percentage of target population, and number of schools and students, either selected alternatives or space was provided so that the respondent could indicate the appropriate information.

The rating form was used by both project staff and the nominators selected from the various educational professions. When used by nominators, the following materials accompanied the rating forms: a summary of the study's objectives and approach; and instructions for the rating form, which included a statement of the criteria and explanatory notes for each criterion. These materials were first pretested with AIR staff who were unfamiliar with the study, and resulting feedback was then used to revise them accordingly. The final version of these materials appears in Appendix A.

The Product Rating Forms were filled out for all products that were identified during the search procedures described below and that appeared to be suitable products for the purposes of this study. Products appeared to be suitable if available information suggested they would meet the definitional and impact criteria and related cut-off points. If a product qualified under impact criterion 2b instead of 2a (i.e., product impact was not directly measurable but it contributed toward accepted educational goals), it was considered only if expected desirable student behavior was specified. As a result, products not oriented toward changing student behavior were eliminated.

It became evident that although the Product Rating Form was useful in determining if a product met the basic criteria for inclusion, additional detailed product information was needed. Thus, a Product Description Form (see Appendix C), designed for staff use, was developed. This form, in addition to that information noted on the Product Rating Form, included such categories of information as:

1. The focus of the product in terms of subject matter (e.g., Language, Mathematics) or facilitating factors (i.e., school organizational efficiency, classroom climate, learning procedures, or perceptual-motor skills).

2. The objectives of the product including short- and long-range goals.

3. Format--whether the product consisted of textbooks, workbooks, television presentations, films, charts, games, computer programs, etc.

4. Training requirements for personnel who implement the product.

5. A summary of the development and diffusion schedule.

6. Measured effects in terms of student outcomes with regard to both cognitive and affective gains.

The Product Description Forms were used primarily as a means to summarize, in detail, all available information after a Product Rating Form was filled out.

Search Strategies Employed to Identify Products

To identify potentially suitable products, the following search procedures were undertaken:

1. A review of the professional literature.

2. A review of selected USOE reports and records not available through standard channels.

3. A review of the exemplary program data collected by Hawkridge, et al, in the areas of vocational education and education for the disadvantaged.

4. The data from the 1960 Project TALENT Survey was used in conjunction with the data from the 1970 Project in Education Survey to identify local districts in which gains indicated the possible use of effective products.

5. A number of projects conducted by the American Institutes for Research which examined the impact of various educational programs were reviewed.

6. Selected nominators, referred to above, representing various professional groups throughout the United States were asked to identify products.

A more detailed description of each of these search strategies follows.

A Review of the Professional Literature

As an initial step in finding leads to or identifying potentially suitable products, a computer search was made via the ERIC/DIALOG Online Retrieval System at the Region IX Office of Education in San Francisco. The computer contained an ERIC data base of more than 25,000 research and research-related reports from issues of Research in Education through March 1970. Documents published earlier than 1965 were not considered. The final body of documents totaled 300 relatively recent reports and journal articles.

In a similar fashion, an additional computer search was undertaken to cover two supplementary sources of potential products. One course, PACE (Projects to Advance Creativity in Education), included completed projects and the other source, Current Projects in Progress, included uncompleted projects. In this search, 101 entries were identified by the computer.

The project was also discussed with staff from the Smithsonian Science Information Exchange. The Exchange prepared 150 "Notices of Research Projects" which described educational studies relevant to the project criteria.

Project staff supplemented the above searches by a review of the current professional literature using the resources of the Stanford University and AIR libraries. A substantial number of leads to potentially suitable products were found through this review. Thus, 581 leads to potentially suitable products were obtained by a review of the professional literature published during the last five years.

The staff followed up these leads by contacting the developer when additional information was needed to complete the Product Rating Form.

A Review of Selected USOE Reports and Records

A review of selected USOE reports, records, and product identification systems, not available through standard channels, was another procedure employed to find leads to or to identify potentially suitable products. ALERT, an information system designed to keep school personnel abreast of the latest Alternatives for Learning through Educational Research and Technology, under development at the Far West Regional Educational Laboratory, was examined. The purpose of ALERT is to increase the awareness, understanding and decision-oriented evaluation of new educational programs. The primary target audience is the "school decision makers"--administrators, teachers, students, parents, and community spokesmen. Although the system is not currently available to public school personnel, project staff were able to review approximately 75 product descriptions. Seventy of these provided leads to potentially suitable products.

The Information Office for the network of R&D centers and educational laboratories has also developed a product identification summary system. The center, located in Denver, Colorado, continually develops descriptions of products as they are being developed by the various centers and laboratories. Project staff were able to obtain from the Information Office all product summaries that had been written before November 1970. These summaries provided 185 leads to potentially suitable educational products.

Several internal documents prepared in the National Center for Educational Research and Development (NCERD) were also reviewed. These identified various sets of products, totaling 30, selected for different purposes than the present project. However, these products also appeared to be potentially suitable products for the present study.

Thus, a review of the ALERT system, summaries from the Information Office for the network of R&D centers and educational laboratories, and several internal documents prepared by NCERD yielded 290 leads to potentially suitable products. In most cases, additional information was needed to complete the Product Rating Forms for the products that appeared to meet the basic criteria. The staff then contacted the developer of each product as necessary and obtained the necessary information.

A Review of the Exemplary Program Data Collected by Hawkridge, et al

As another strategy, exemplary programs evaluated by Hawkridge and his collaborators in the areas of vocational education and education for the disadvantaged were reviewed. It was anticipated that, since these programs reportedly contributed to student gains, they may have employed educational products suitable for consideration in the present study. The following program reports were carefully examined:

1. A Study of Selected Exemplary Programs for the Education of Disadvantaged Children (Hawkridge et al, 1968). The purpose of this study was to identify and describe successful educational programs for culturally disadvantaged children. Successful educational programs were defined as those which contributed to measured gains in cognitive achievement. Twenty programs were described in the report.

2. A Study of Further Selected Exemplary Programs for the Education of Disadvantaged Children (Hawkridge et al, 1969). This study was a sequel to the one above, and the aims were identical. Eleven additional programs were described.

3. A Study of Selected Programs for Vocational Education in Secondary Schools (Hawkridge et al, 1970). The aims of this study were to identify and describe vocational education programs at the secondary level that had been successful in increasing the placement rate of treatment students, compared with students enrolled in other courses of instruction. Although a pool of 445 programs were identified, no program was described in sufficient detail to identify potentially useful products. Furthermore, none of the 445 programs met the original study's criteria.

A review of the exemplary program data collected by Hawkridge and his collaborators resulted in 32 leads to potentially suitable products. In each instance in which the programs indicated potentially useful products, as defined for the purposes of this study, further information was obtained from the files developed for the projects. As necessary, additional information was then obtained by contacting the developer of the particular product.

A Review of the Progress in Education Survey

Another method for identifying educational products involved the search for research and development products used in high schools in which students had demonstrated group gains in reading comprehension. This was done by using data from the 1960 Project TALENT Survey conducted by the University of Pittsburgh and the American Institutes for Research (Flanagan et al, 1964; Flanagan, 1971), in conjunction with additional data derived from the 1970 Progress in Education Survey conducted by AIR (Jung, 1971). The 1970 survey used the TALENT reading comprehension test to determine whether a measurable increase in reading skill had occurred during the decade of 1960-1970. It was felt that this would provide one of the most reliable indicators of improvement in educational programs since 1960.

In 1970, 12,722 students from 134 schools which had participated in the 1960 Project TALENT Survey were identified. The mean reading comprehension raw scores for each school were calculated for 1960 and 1970. The changes in the means from 1960 to 1970 were also calculated. Only those schools whose change scores equaled at least one-third of their standard deviations were included for further examination. It was assumed, as a rough rule of thumb, that change scores of less magnitude would not warrant further consideration for the purposes of the present study. Thirty schools, or about 25% of the total sample, met this criterion. Of the 30 schools, those in which the number of students who participated in both surveys totaled less than 20, and/or those in which the principals indicated that the socioeconomic level of the community was higher in 1970 than in 1960, were excluded from further examination. Eight schools were thus excluded.

The remaining 22 schools were queried for information regarding possible products introduced during the last five years, products which may have contributed to the reading achievement gains registered by their students. Principals of each of these schools were informed that their students registered gains in reading achievement from 1960 to 1970 that appeared greater than those achieved by students in many of the other schools participating in the survey. The principal was then given a brief description of the present project and was asked to identify some of the more effective educational products that his school had introduced during the last five years. Enclosed with the cover letter were five Product Rating Forms noting the criteria for suitable products for the present study. Approximately 50% of the principals responded. Several indicated that they had not used during the last five years any new products meeting our criteria. Principals who did not respond were telephoned and asked to nominate products over the phone. Only 15 leads to potentially suitable products were obtained. For each case in which a potentially suitable product was identified, information was then obtained from the developer or the disseminator of the product.

A Review of Projects at the American Institutes for Research

A number of projects currently being conducted or recently completed at the American Institutes for Research examined some aspects of the impact of various educational programs. These projects were reviewed to see if suitable educational products could be identified. Projects reviewed were:

1. The Assessment of Exemplary Programs for the White House Conference on Children (Shanner, 1970). The purposes of this project were to describe and analyze programs in terms of objectives, content, method, costs and benefits; and to recommend procedures to facilitate visits by educators to exemplary sites.

2. Implementation of the Cooperative Longitudinal Study of Demonstration Education Programs (Chalupsky, 1970). This project is aimed at identifying the innovative components of large-scale innovative

programs which appear to exhibit the greatest impact on students in elementary and secondary schools.

3. Further Examination of Exemplary Programs for Educating Disadvantaged Children (Wargo, 1971). The objective of this study is to identify and disseminate information about compensatory education programs which have been successful in producing measured benefits of cognitive achievement.

4. The Development and Validation of an Evaluation System for Ascertaining the Effectiveness of Educational Laboratories and Research and Development Centers (Dunn, 1970). This project is aimed at developing and pilot testing a comprehensive data collection and reporting system, compatible with current Office of Education procedures. The proposed system will allow detailed analyses of the degree to which activities supported by the National Center for Educational Research and Development are meeting their goals.

5. The Evaluation of Selected Teacher Training Programs (Tallmadge, 1971). This study was designed to identify various patterns of successful teacher training and to analyze those program characteristics contributing to success.

For each of these projects, comprehensive files containing a variety of information had been developed. These materials were carefully examined to identify potentially suitable educational products and to obtain sufficient information to complete the Product Rating Forms. Sixty leads to potentially suitable products were found.

If still further information was needed to complete the Product Rating Forms, the product developer and/or disseminator were contacted directly.

Nominations from the Educational Professions

Independently of the above procedures, products were also identified by selected nominators representing various educational professional groups throughout the United States. A list of 200 potential nominators from a variety of professional interests and institutions was identified. Included were representatives of the regional educational laboratories, research and development centers, policy research centers, regional offices of the United States Office of Education, centers for vocational education, major universities, state departments of education, selected school districts, non-profit private organizations, private foundations, profit organizations, major educational publishers, and representatives of the Department of Health, Education, and Welfare.

One hundred nominators were initially selected from the pool of 200 to recommend products. Government, profit-making, and private non-profit agencies were equally represented in the selected group of 100 nominators. These nominators were contacted initially by telephone to obtain an advance commitment to identify products. In some cases, the nominator directed the project staff to another member of his organization (in these cases, this member was then telephoned). During the telephone conversations, the staff briefly described the scope and purpose of this study and outlined the services requested of the panelist. Once the advance commitment was obtained, the panelist was sent a cover letter, instructions for rating forms, and 10 Product Rating Forms. The cover letter briefly summarized the project's objectives and purposes and the task required of the nominator. The instructions for the rating forms included detailed descriptions of the criteria for selecting educational products. Samples of the cover letter and instructions are contained in Appendix A. Each of the 100 nominators were contacted by both telephone and letter within a two-week period.

If the rating forms were not returned within a two-week period, follow-up telephone calls were made. During these follow-up calls, the staff queried the nominator as to whether the forms had been received and whether he had had a chance to review and fill out the forms sent. Again, in some cases, the nominator had passed the forms on to another member of his organization. In such cases, the staff contacted the new representatives and urged them to fill out and return the Product Rating Forms. If the rating forms had not been returned within a second two-week period, the nominator was again telephoned. At this time he was asked to nominate products over the telephone and a staff member filled out the Product Rating Forms during the telephone interview.

Eighty percent (80%) of the nominators responded within six weeks from the date of the initial contact. Some of the difficulties usually associated with mailed questionnaires were attenuated by the initial personal telephone communication prior to any mailing. The follow-up calls were equally useful. If the Product Rating Forms were not completely filled out, or if the nominator circled an "I don't know," the original developer or the disseminator was then contacted to obtain the additional needed information. While many Product Rating Forms were returned, only 60 unique products were identified through this search procedure, as nominators frequently identified the same products.

Consultant Conference

A conference was held December 14-15, 1970, at the Palo Alto office of the American Institutes for Research. The overall purpose of the conference was to review this study. The objectives of the conference were to review the selection criteria, the products identified to date, and proposed case study procedures, and make recommendations for further activities.

Participants at the conference represented government, profit-making, and private non-profit agencies and were: Egon G. Guba, Associate Dean, School of Education, University of Indiana; Arthur A. Lumsdaine, Professor of Psychology, University of Washington; Norman Boyan, Dean of the School of Education, University of California at Santa Barbara; Robert Mager, Consultant to the American Institutes for Research; William V. Clemans, Vice President, Educational Systems, Science Research Associates; David Engler, Instructional Technology, McGraw-Hill Book Company; and John C. Flanagan, President, American Institutes for Research. In addition, James Becker, Director of Research for Better Schools, Philadelphia, Pennsylvania, participated in a similar review and discussion with the staff, but was unable to attend during the conference dates.

During the two-day conference, one day was devoted to the subject of product selection and the other day to a discussion of case study procedures. Several suggestions were made pointing to further clarification of the criteria for product selection and more precise definitions of the major concepts included in the criteria. In most cases, consultant suggestions resulted in additional explanatory notes supplementing the original criteria. For those criteria for which one of several cut-off points could be selected, the consultants tended to offer differing recommendations. In general, the consultants from profit-making sources suggested large-scale usage by schools and number of students, while university-based and research and development oriented consultants suggested that product effectiveness in terms of demonstrated student gain was more critical than widespread adoption. It was generally agreed that products with an available research and development history and with reasonably "hard" data on student gain in either cognitive or affective areas should be given weight for inclusion, other factors being equal.

Considerable discussion was generated regarding products which are not directly related to student classroom behavior, such as products focusing on teacher training or modular scheduling. A number of suggestions were made as to both areas that might yield useful products and particular products that were not included in the initial list at that time. Such suggestions were followed by the staff and yielded 30 leads to potentially suitable products.

The consultants also reviewed the tentative classes of variables scheduled to be identified in the case studies. They warned that a tight and structured interview schedule could color the results, and recommended that information gathering be as open-ended as possible in a form that would allow what actually happened to emerge. Developers who feel they were successful may forget all the problems they had, while those who were unsuccessful may give invalid reasons for their failures. Although problems related to management or personality conflicts within an organization may be important factors in the history of a product, this information may be difficult to obtain. Every effort should also be made to identify organizations started on an opportunistic basis.

It was noted by the consultants that complete reliance on the developer and disseminator of a product for information might be questionable since they have an abvious bias and may not report data which reflect unfavorably on their product. It was suggested that an attempt be made to obtain data on the effectiveness of the products from sources other than the developer. If data from one source contradicts other information on the product, it is necessary to study carefully how the evaluations were designed and conducted in order to decide how much confidence to have in the results.

Regarding the availability of information, the consultants pointed out that data on product effectiveness gathered by someone other than the developer will be the hardest to obtain. In addition, although some developers may have information on the development of their products, it may not have been analyzed or reduced to a useful format. It was felt that few commercial publishers may have the kind of developmental information being sought. Publishers rarely conduct any systematic evaluations of products being developed, and data informally gathered are not reduced to a readable form.

All consultants agreed that the trend exemplified in the present study of examining in detail the research, development, and diffusion history of educational products represented a healthy trend in education. Some doubt was expressed as to how many general conclusions could be derived, considering the small number of cases and the large number of variables involved both within and between products. The consultants also concluded that since other studies have dealt with adoption and the effectiveness of a product, this study can make the most valuable contribution by concentrating on the developmental history of products.

Selection of Products for Case Studies

Initial Selection of Exemplary Products

As discussed in greater detail in the Results section below, the application of the definitional and impact criteria presented above to the list of products that had been identified resulted in the location of 117 products that met the criteria. Criteria for the selection of about 20 exemplary products on which case studies would be made were then developed. It was initially anticipated that the specific criteria for the selection of the exemplar products would include the following:

1. About two-thirds of the products would be "tangible," (i.e., a specific thing such as a curriculum, workbook series, TV course, etc.), the other third "less tangible" (including techniques, organizational concepts, and procedures such as team teaching, systems for individualizing instruction, etc.).

2. The products selected would represent the various source categories from which such products are made available to the schools.

3. Products representing various target populations would be selected to improve chances of securing generalized findings.

4. A few products for which the initial educational impact seems to have disappeared would be included.

Detailed consideration of these potential criteria uncovered a number of problems, such as difficulty working within the "tangible," "less tangible" distinction. An alternate procedure was, therefore, employed.

As a first step in identifying a pool of exemplars from the 117 products meeting the definitional and impact criteria, two further criteria were imposed. These were extent of use and evidence of student gain. To quantify extent of use, a three-point scale was used to identify high, moderate, and low use. The products used in 5-24 schools were rated low, products used in 25-99 schools were rated moderate, and products used in 100 schools were rated high. For evidence of student gain, products for which one type of gain (e.g., cognitive student gain, affective student gain, or contributions through facilitating factors) was indicated by only a nominator were rated low. Products for which more than one type of gain was indicated by a nominator were rated moderate. Products for which gain was indicated by a nominator and for which there was supporting evidence suggesting a carefully controlled study were given a high rating on gain. If a product was rated as moderate or high on one of these two criteria, it was retained in the pool.

The use of these two additional criteria yielded a fairly large pool of potential products. The following constraints were, therefore, imposed to reduce the available pool:

1. Focus of the product. The two overall kinds of focus in these products were either subject matter or factors facilitating learning, but not directly related to a specific subject matter. This latter focus included such purposes as organizational efficiency, classroom climate or operation, learning procedures or methodology, and improved perceptual-motor skills. An attempt was made to get approximately equal representation of products directed in each of the five content areas of mathematics, science, social studies, language, and vocational education. In addition, a representation of products dealing with the facilitating conditions which would be approximately equal to the number of products in each of the major contnet areas was sought. Thus, a successful application of focus balancing would result in perhaps four products in language, four in mathematics, four in vocational education, four dealing with facilitating conditions, etc. This constraint was applied successfully except for vocational education products. There

were simply not a sufficient number of such products that met the basic definitional and impact criteria.

2. Source of development. An attempt was made to represent the three major sources of product development; i.e., government agencies, private non-profit firms, and profit firms. Although an attempt was made to represent these three groups equally, this was not feasible in light of the original pool of 117 products. Representation of government sponsored developers about equaled the combined representation of private non-profit and profit firms.

3. Format. An attempt was made to select the final set of products so that a variety of formats would be represented. These include the range from a simple textbook and manual to a profuse diversity of audio-visual, game, and other relatively exotic materials.

4. Grade level. An attempt was made to obtain representation of products directed at every range of grade level from K-12. Thus, some products were included that covered the entire K-12 range; others included only K through the primary grades; others the intermediate grades; others high school. An attempt was made to balance this so that the bulk of the products were neither in the primary grades nor in high school; nor were the K-12 all-inclusive types of products.

5. Visibility. In those cases in which two or more products met the above criteria and constraints and it was necessary to select one product, weight was given to the product with the most "visibility." These were products that had attracted a great deal of attention within and sometimes without the educational profession. Often they were products that had recently been, or are currently being hailed as emblematic of a new movement or programmatic effort.

As noted above, it was considered desirable to include in the products selected for case study a few for which the initial educational impact seems to have disappeared. It was, however, impossible to locate such products with certainty since attenuated impact is difficult to define. In addition, all products nominated had met the impact criterion, and the initial information available on each product did not permit the identification of lost impact. Often times products may appear to have suffered a temporary loss of impact which is then regained with a revised form of the product. An attempt was made, then, to locate for this category products that are growing very slowly in comparison to others, or products for which no further developmental or revision funds appeared to be available.

Selection of 21 Products From Among the Exemplars

Application of the above procedure resulted in the identification of 33 exemplary products. The following criteria were then applied to select 20 exemplary products for case study, and 13 alternates:

1. Products were grouped according to the focus. Products within a focus group that had the lowest rating on extent of use and student gain were placed on the alternate list.
2. An attempt was made to maintain the balance across grade levels and content areas.
3. If other factors were approximately equal, visibility was given additional weight.
4. Two products which appeared to meet the criteria for possibly attenuated impact were included, plus one product that appeared to have lost impact initially but then regained it in a revised form.

Project PLAN, developed by the American Institutes for Research and the Westinghouse Learning Corporation, had met all of the selection criteria but had been excluded from consideration since this study was being conducted by AIR. After 20 exemplary products were selected for case study in fulfillment of the contractual obligations with USOE, PLAN was added as the 21st product. As noted below, this gave the opportunity to develop and refine case study procedures before they were applied to the 20 other products.

Rationale for Changes in the List of 21 Exemplars

As the project proceeded, four products on the initial list of 21 had to be dropped and replaced with products from the alternates. One product was dropped because no cooperation could be obtained from the developer/disseminator. After several telephone calls, it was obvious that much of the information needed would not be retrievable. The decision to drop the product was made before a letter, indicating the selection of it as one of the 21 exemplars, was sent. For a second product, the originator and developer did not want to participate. He had severed ties with the R&D center where he developed the product, but the product remained in the hands of the R&D center. This critical staff member wished not to support or be involved in any R&D center related efforts. Consequently, the product was dropped from the list as there was no staff member at the R&D center who could adequately provide the needed information. This decision was made after a letter, indicating selection of the product as one of the exemplars, was sent to the developer.

Absolutely no cooperation could be obtained from the developer of a third product. Many attempts, including a series of telephone calls, were made to obtain a commitment to participate. This occurred after a letter, indicating selection of the product as one of the exemplars, was sent. The developer was never "available." Consequently, the product was dropped from the list. A fourth product on the original list was dropped because one of the selected alternate products was from the same organization that had already had one product selected.

The reasons for selecting specific alternate products to replace the four that were dropped were noted. One product, which was highly rated on several of the most critical criteria, included activities similar to a product that was dropped. A second product, which was also highly rated especially on the scope criteria, provided a third social studies curriculum to parallel the three in science and language. A third provided a solid language product that was rated very highly on scope criteria, while a fourth provided a good replacement for a dropped mathematics product and in addition represented one of the few available programs of its type.

A list of the finally selected 21 products is given on page 37 in the Results section, below.

Development of Procedures for Collecting Case Study Information

The procedures for collecting case study information were developed iteratively in conjunction with determining the components of the case studies and actually trying out the techniques on the first few products. This section outlines the intended attributes for the case studies and the components that would be included in each case study. A report on the evaluation of the components of the case studies is then presented, followed by the major steps employed in collecting case study information.

Intended Attributes of Case Studies

It was intended that each systematic case study of the 21 exemplary products would possess the following attributes:

1. It would present the evolution of a product in fine-grained detail. Such an account would present a more in-depth view than is ordinarily available in the literature.

2. It would contain an accurate reconstruction of the actual steps followed in the development and diffusion of the product.

3. It would include those variables of interest in current thinking about instructional development and diffusion.

4. It would encompass a critical summary of all available evaluations of the product conducted before the product was made generally available to users, i.e., evaluations during development, including field testing.

Each of these attributes was to be obtained through the case study procedures which were to be followed in tracing the history of each educational product from its origin to its adoption and utilization. The specific procedures for obtaining information for the case studies were developed accordingly.

Components of the Case Studies

It was initially anticipated that the systematic case studies were to include the following information as a minimum:

1. Origin of the product--where the idea came from.
2. The design and conceptualization of the innovation.
3. History of the development of the product, including the source of support and the identity of the developers.
4. Information on field or pilot testings of the product, and the results of such analyses.
5. Efforts in the dissemination of information about the product.
6. Information and data that might serve as direct or indirect measures of the impact of the product in its operational form; included would be data on the number of students involved, the number of items sold, any surveys of student and teacher reactions, summaries of evaluative studies aimed at investigations, etc.

In considering the best approach to recording and presenting the information that was to be collected, it was decided that the developed case study for each product would include four components:

1. A systematic narrative history.
2. A product data record. This was to consist of a systematic coded matrix of those quantifiable aspects of products: quantifiable aspects of design, development, diffusion and adoption, including census-type information, product characteristics, and evaluative data. Information in such a matrix was to be arranged and coded for possible key-punching and machine treatment of the data.

3. An analysis of the developmental sequence of each product. This was to be summarized in a flow-diagram analysis of the sequence of major events in each product's developmental history.

4. A description of the critical decisions in the history of the product.

How the actual design of each of these components evolved is described below.

Evolution of the Components of the Case Studies

Initiation of a Master Outline for narrative history. Based upon the kinds of information that it was anticipated the narrative history of each product would include, a Master Outline was initiated. It was assumed that the Master Outline would not only guide the site interviewers, but would also be used in preparing the report on each product. Initially, the critical decision information, the major event flow diagram, and the product data record were planned as separate documents not to be integrated into the narrative history. Information in the narrative history was to focus on the origins, the development, the evaluation, the diffusion, and the adoption of the product, and a brief product description.

As more and more information was specified as necessary for completing a narrative history of a product, it became apparent that more guidelines were necessary than initially envisioned. Guidelines were developed to explain what each section of the narrative history should include, and how such information could best be obtained. The development of explanatory notes and the suggestion of interview strategies led to an amplification of the Master Outline. The additional exploration and questioning resulted in more and more detail in the outline.

Trial of techniques during training of site interviewers. With an intermediate version of the outline for the narrative history and an understanding that quantifiable data would be needed to complete the Product Data Record, that some form of major event flow diagram would be desirable, and that a documentation of the critical decisions would be informative, staff members pilot tested the strategies to be employed in site interviews. First, in role playing situations, staff members, playing the part of the product developer or the interviewer, tested the procedures designed to obtain the necessary information. This step led to modifications in interview techniques and to an intermediate version of the Master Outline. A second and final exercise involved the application of the search procedures to Project PLAN, which had been developed at AIR. All potential site team members reviewed documentation on PLAN, and conducted interviews with key personnel. Each key person interviewed presented the staff with a critique of his approach and technique. Again, modifications were made in both the search procedures and the Master Outline.

Modification of case study components. As the site visits were being conducted, more modifications were being made in the design of the narrative history, the major event flow chart or diagram, the critical decision description, and the Product Data Record.

The major event flow diagram was to provide the reader of the report with a convenient symbolic overview of the major activities in the product's history. To achieve this objective, the flow chart was to consist of two parts: a symbolic illustration and a narrative describing the illustration. The objective of the flow chart was not changed. However, the flow chart was made self-explanatory so that a narrative, other than that found in the text of the narrative history, was not needed.

The critical decision description had a similar history. The purpose of the critical decision description was to provide the reader with a convenient overview of the critical decisions made in the history of the product. It was to consist of two parts: a symbolic diagram and a narrative describing the diagram. The objectives never changed, but the symbolic diagrams were never developed as a straightforward narrative was found to be the most effective means of presenting the overview of the critical turning points. The narratives came to include: the decisions that had to be made, the alternatives available for each decision, the alternative selected, the forces leading to the selection of a particular alternative, and the consequences resulting from the selected alternative.

In considering the most efficient method for reporting information on the case studies with the simplifications noted above, it was decided to include the narrative history, flow chart, and critical decisions narrative for each product in one document called a Product Development Report. It was further decided that the Product Development Reports would be prepared as separate documents rather than appendices to the final report. A list of the Product Development Reports is given in Appendix H. In addition, the Master Outline for the narrative history was reworked to become the Master Outline for the Product Development Reports. The Outline, which appears in Appendix F, came to include sections for: product description; origin of the product; development of the product (the major event flow chart appears in this section or the section on the origin of the product); evaluation of the product; diffusion of the product; adoption of the product; future of the product; and a description of the critical decisions in the history of the product.

The development of the Product Data Record, containing quantifiable aspects of product design, development, diffusion, and adoption, paralleled the development of the Master Outline. In fact, as the major sections of the Master Outline were expanded, specific data elements were identified and included on the Product Data Record. Each item on the Master Outline that could be reasonably quantified (i.e., in terms of numbers, yes or no, or a rating system) was included. When necessary, guidelines for filling out the Record were specified. The Product Data Record remained a separate component and was not an integral part of the Product Development Report.

Major Steps in Collecting Case Study Information

Initial agreement with product development and/or diffusion agency. Personal communication was utilized to seek cooperation and commitment to the case study for each exemplary product. The product agency was presented with an orientation to the purpose and general approach of the study, the information required, and the probable outcomes of the project.

Retrieval of available product records. An attempt was made to obtain in advance, from the development and/or diffusion agency, available records relevant to the case study of the product. The extent of these records varied widely from product to product. Minimally, a general report and some brochure-type information was obtained from the developer. In some cases, records included original proposals, progress reports, in-house records, budget and schedule data, etc. Records from the diffusion agency included sales and distribution information; e.g., extent of distribution, identification of users, and date of delivery.

Transposition of information from product records. How much information was retrieved and how much time was available for pre-site visit writing determined the extent to which the narrative history, the flow diagram, the critical decision description, and the Product Data Record were initiated. In some cases, a good draft was prepared for each of these components before the site visit was conducted. In most cases, however, these components were only in very rough form before the interview with the developer. An attempt was made to determine which information had been retrieved, which could be obtained from documents obtained during the site visit, and which could be obtained only from the developer in the interview. Thus, all the information that could be retrieved on each product was utilized to: frame an initial outline of the product case history; sensitize site visit personnel; identify areas for further exploration during the interview; and provide a basis for comparison with interview information.

Site interviews. Arranging for economic site visitation trips required extensive scheduling within a product development organization, among the various key staff, and between different product development groups. Typically, the development staff on a particular product were involved in other projects and were frequently found to be working for other organizations in other locations at the time of the site interview. There were also cases in which the key developer had left the original organization and was working in an entirely different region. During the interviews an attempt was made to obtain information regarding those factors not obtainable from the written materials. When pre-site visit writing was very minimal, the topics discussed with the developers covered the entire range of factors for all the components (e.g., the narrative history or the critical decision description). All interviews were tape-recorded.

Transposition of site interview information. Upon returning to AIR from the site visits, the tape-recorded interviews were transcribed.

Usually, the developers discussed factors related to each of the components (e.g., the major event flow diagram or the Product Rating Record); the information was organized under the various components after the tapes were transcribed.

Throughout the case studies, a continuous attempt was made to obtain the most valid retrospective information concerning the product's history. To this end, a check and balance system was maintained and involved comparisons between product records and interview data; comparisons between information obtained from two or more respondents interviewed independently; and comparisons of information derived from development, diffusion, or user agencies. The development and the diffusion agencies were separate entities in some cases. In other cases, such as the regional laboratories, these functions were served by one agency, or even the same group within that agency.

Preparation of Product Development Reports and Product Data Records

Procedures for Preparing Product Development Reports

After the site interview information was transcribed, the writer of a Product Development Report organized all available information by grouping it under the relevant sections of the report (e.g., under origins or under critical decisions). Once the information was grouped, the writer wrote each section, one by one, until the entire report was completed. In order to maintain uniformity from one Product Development Report to the next, each report was prepared following the Master Outline as a guide, and using headings from it. Depending upon the specific product, at times lower level entries on the outline were not needed, and the materials were grouped under higher level headings. Certain sections of the outline, such as Development of Performance Measures/Assessment Techniques, were rarely used since the information was not available above and beyond that included in the section on Funding for Product Development.

During the preparation of the Product Development Reports, in many cases some additional information was needed and the developer or disseminator of the product was contacted. In some cases the original draft of the report, completed before the site visit, was a good starting point. Quite often the information in the original draft was simply grouped under the relevant sections of the outline, just as was all other information.

After a Product Development Report was completed and reviewed by the staff, it was sent to the developer for review. The developers either telephoned the revisions they thought necessary or mailed them in a letter to AIR. The extensiveness of the requested revisions varied from a few editorial comments to extensive revisions of several sections. In most cases the revisions requested by the developers were made; however, in a few instances the requested revisions would have lowered the descriptiveness of the report and were not made.

Complete responsibility for interpretations concerning any facet of development, evaluation, and diffusion rested with the authors of the report.

Procedures for Coding Product Data Records

The Product Data Record for each product was typically completed right after the site visit; it was then reviewed and modified after the corresponding Product Development Report was completed. Changes were usually made in how the elements were coded after the Product Development Report was completed. That is, information needed to write the Product Development Report was also needed to code the data elements for the particular product; this information was not conveniently available until it was included in the various sections of the report. All Product Data Records were carefully reviewed to make certain that each element was coded as accurately as possible, given the available information. The elements of the final Product Data Record are given in Appendix G, which was used to tabulate data for the 21 exemplary products for the Results section below.

Coordination With Other Projects

At least certain superficial similarities appeared to exist between the project discussed in this report and three other USOE-funded projects, and a continuous effort was made to communicate and coordinate activities among these projects. The other projects included: "Generation of Information to Support Long-Term Manpower Studies of and Planning for Training Programs in Educational Research, Development, Diffusion and Evaluation" conducted by Teaching Research Division of the Oregon State System of Higher Education; "The Development and Validation of an Evaluation System for Ascertaining the Effectiveness of Educational Laboratories and Research and Development Centers" being conducted at the American Institutes for Research (Dunn, 1970); and the Product Evaluation Project conducted at Educational Testing Service for the National Center for Educational Communications (Epstein et al, 1971). Either the directors of or the appropriate USOE personnel concerned with each of these other projects was contacted with regard to the objectives and procedures of the projects as they related to the project discussed in this report. Continuing communication was made so that minimal overlap and maximum productive complementariness of effort was maintained.

RESULTS

Through the search procedures described in the Method section, 1,068 leads to potentially suitable products were found. About three-fourths of these products were excluded without using Product Rating Forms; the available information obtained indicated that these excluded products obviously did not meet the definitional and impact criteria discussed above. Product Rating Forms were employed for 235 products; at that time the available information on these products indicated that they might meet the criteria imposed by this study. However, employment of the criteria and related cut-off points discussed above reduced this number to 117. It may be noted that employing the criteria, including the one which indicated that products must have produced results which suggest a measurable gain toward accepted educational goals (or which suggest a contribution toward such goals), and the relevant cut-off points for the various criteria, did not make the final pool of selected products too small for the purposes of this study.

Relative Effectiveness of Search Procedures

The most effective search procedure employed was the review of selected USOE reports, records, and product identification systems. This included an examination of the ALERT system, product summaries from the Information Office for the network of R&D centers and educational laboratories, and internal documents prepared by NCERD. The procedure yielded more than 100 leads, most of which were of high quality. That is, they frequently led to suitable products for which Product Rating Forms were completed. Two procedures, obtaining nominations from the educational professions and reviewing current projects at the American Institutes for Research, resulted in a moderate number (i.e., 50-100) of leads, and most of these were of high quality. During the consultant meeting, only a few leads (i.e., about 29) were obtained, but these were mostly high quality leads. The review of the professional literature yielded many leads to products, but most of these leads were of low quality in that they frequently did not lead to suitable products for which a Product Rating Form was completed. Finally, two search procedures, reviewing the exemplary program data collected by Hawkridge, et al, and a review of the Progress in Education Survey, resulted in a few leads to products, and most of these were of low quality. Thus, it seems that the best procedures for identifying educational products with impact involve an examination of various information sources or product data files like the ALERT system and a request for nominations from members of the educational professions, perhaps members who were specialized in one subject matter area and who had summarized R&D in that area.

Reasons for Excluding Products for Which Product Rating Forms Were Employed

Products were excluded, not for lack of merit, but for not meeting the specific criteria for this study. About 60% of the products excluded were developed by government sponsored agencies, and the remaining 40% were about equally divided between private non-profit and profit-making organizations. Thus, the representation of the three types of developers in the excluded group of products was very similar to that in the group of selected products. Likewise, fewer products in the vocational education content area than in any of the other content areas were excluded, just as the vocational education content area was not represented as frequently as the other content areas in the group of 117 selected products (see Table 3 for the percentage of the 117 selected products by content).

Products for which Product Rating Forms were employed were excluded primarily for six major reasons. About 4% of the products were excluded because they were implemented in pre-kindergarten classes not associated with a general K-12 school program. About 11% were excluded because they were used in less than five schools. About 5% were excluded because the target population at which the product was aimed was less than a fourth of the total population in United States schools at the intended age or grade level. Nearly 29% were excluded because they were still being developed and had not yet come into use in the schools. Finally, almost 38% were excluded because their impact was measurable only in terms of contributions toward accepted educational goals and the expected, desirable student behaviors resulting from these contributions were not specified.

Description of the 117 Selected Products

Each of the 117 products that passed the criteria imposed by this study are described in brief paragraphs in Appendix D to give the reader a general idea of the types of products that did pass the criteria. These brief paragraph descriptions typically include the following kinds of information: the focus of the product (subject matter and/or one or more of the facilitating factors--organizational efficiency, classroom climate or operation, learning procedures or methodology, and perceptual-motor skills); the content language, mathematics, science, social studies, and vocational education); grade levels covered; target population percentage; objectives; approach to subject area (e.g., non-graded, individualized, traditional, etc.); and format (e.g., textbooks, workbooks, films, etc.). Appendix E gives a detailed description of each of the 117 selected products using 19 descriptions.

Characteristics of the 117 Selected Products

The characteristics of the 117 selected products in terms of the descriptors used in Appendix E are presented below.

Focus

Focus of a product refers to what it deals with most directly, subject matter content (e.g., language), and/or one or more facilitating factors. As may be recalled, it is through these facilitating factors that a product might contribute toward accepted educational goals. A product might focus on only subject matter, only one facilitating factor, or several facilitating factors, or any combination of subject matter and facilitating factors.

Table 1 shows the frequencies and percents of the 117 selected products with the various foci or combinations of foci. Subject matter was by far the dominant focus. One hundred products (85%) had a focus of subject matter only, while 103 products (88%) included subject matter as a focus. Ninety-one percent of the products had a single rather than a multiple focus. Organizational efficiency was a focus of 3% of the products, classroom climate or operation and perceptual-motor skills 6%, and learning procedures or methodology 10%. There were no products with only organizational efficiency or classroom climate as a focus.

The focus of the 117 selected products by grade level is given in Table 2. For each focus the 117 products were distributed fairly similarly across the 13 grade levels, although there was some tendency for classroom climate, learning procedures, and perceptual-motor skills to be more highly represented in the primary grades.

Content

Content of a product refers to which of the five major subject matter content areas (e.g., language) for which it was designed. If a product is focused on subject matter, the particular subject matter would indicate the content of the product. If a product is focused on a facilitating factor; e.g., learning procedures, the particular subject matter for which the learning procedures were designed would indicate the content of the product. A product may be designed for one or more of the five major content areas.

Table 3 shows the subject matter content of the 117 selected products. Mathematics and vocational education (26% and 9% of the products, respectively) were not as well represented as language (35%), science (39%), and social studies (42%). The relatively small number of nominated vocational education products had been noted early in the project, but adding additional nominators in this area did not result in a large number of such products being located and passing the selection criteria. About 79% of the products were designed for a single rather than multiple content, with a quarter of the products focusing on social studies only. Three percent of the products had subject matter content in all five areas, 9% in language, mathematics, science, and social studies.

As noted in Table 4, which presents the frequencies and percents of the 117 selected products by grade level and content, more products were designed for language and mathematics at the elementary level than at the secondary level; similar numbers of products were designed for science and social studies at the two levels, and more products were designed for vocational education at the secondary level than at the elementary level.

Format

The format of a product refers to the mode in which information is presented. Formats considered were: paper products (including textbooks, workbooks, manuals or guides, and tests); audio-visual (television, films, and audio equipment); kits and equipment (including displays, games, and laboratory equipment); and computer. A product may have one or more of the various types of format. Table 5 shows the frequencies and percents of the 117 selected products with the various formats. Seventy percent of the products had a multiple format rather than a single format. Most products (85%) included some type of paper product. About 40% included the audio-visual format, and a similar percentage included the kit and equipment format. Only 9% of the products involved the use of the computer, as may have been anticipated. The most frequent combination of formats (58%) was manuals or guides and other format(s), with textbooks and other format(s) not far behind (56%). Textbooks only were used as the format for only 9% of the products, while no products used only workbooks, tests, television, films, kits, displays, or laboratory equipment, as may have been expected.

Grade Level

Grade level refers to the grades (i.e., K-12) in which the product was being used. Table 6 shows the frequencies and percents of the 117 selected products designed for each grade level. Table 7 shows the frequencies and percents of these products by the number of grades covered. The various grade levels were nearly equally represented; however, grades one and two tended to be represented more frequently (51%) than the other grade levels. Very few products (19%) were designed for a single grade level. More products (30%) were designed to cover four through six grade levels than any other range of grades. However, a significant number of products were designed for nearly all grade levels.

Percent of Target Population

Percentage of target population refers to the percentage of the total population in United States schools at the intended age or grade level for which the product was aimed or designed. Table 8 shows the frequencies and percents of the 117 selected products by intended percent of target population. The majority of the products (68%) were targeted for the total population at the intended age or grade level. Very few products (8%) had a 25% target population, which was the cut-off point for this variable on the impact criteria used to select products.

Number of Schools and Students Using the Product

Table 9 shows the frequencies and percents of the 117 selected products by the number of schools using the product. Table 10 shows the frequencies and percents of the 117 selected products by the number of students using the product. About one-half of the products were being used in more than 100 schools and by more than 10,000 students. A number of products were used in more than 5,000 schools (4%) and by more than 100,000 students (16%). Product use in at least five schools was one of the criteria used in selecting products with impact. The intent of this criteria was to exclude those products that work due primarily to the efforts of one person.

Degree of Dissemination

Degree of dissemination refers to how frequently the product was brought to the attention of the educational profession through print channels, conventions, or other broad dissemination procedures such as marketing techniques. Twenty-six percent of the products were brought to the attention of the educational profession through more than 10 known sources, 28% through six to nine sources, and 46% through two to five sources. It may be recalled that one of the criteria for selecting products was that reference to the product should exist in the literature in more than one journal as a minimum, and its existence should be "known" by some reasonable proportion of professionals working in the discipline.

Year Product Came Into Use

Year came into use refers to the year in which the product was available for adoption in a school system. Table 11 shows the frequencies and percents of the 117 selected products by the year the product came into use. More products came into use in the later years of 1965-70 than in the earlier years of this period, with 25% coming into use in 1970 compared to only 6% in 1965. It may be recalled that the criteria for selecting products included that the product should have come into use in the schools during the last five years. Only 18 products came into use prior to 1967 so that possibly this criterion could have specified only the last three years. These data should be interpreted cautiously, however, since at times it was difficult to pinpoint the exact date a product came into use.

Measured Gains

Each individual who nominated a product was asked to indicate whether or not the product produced results which suggested measurable student gain toward accepted educational goals. For 86% of the products, the answer was "Yes," while for the remaining 14%, "Don't know" was the response. Independent of what the nominator indicated, some attempt was made to locate and identify the type of evidence for measured student gains, and classify the gains as either cognitive or affective. Such evidence was typically found in research reports or articles obtained from the developer of the product. The type of evidence varied from a tightly controlled experiment to recorded observations of behavior. Although it was found that 11% of the products had evidence of cognitive gains based upon the use of pre- and post-standardized tests with a control group, evidence for cognitive gains was not located for 75% of the products since adequate documentation was not available. Similarly, for 92% of the products evidence for sustained cognitive gains over time could not be located. Evidence of measured affective gains were located for only 16% of the products, while evidence of sustained affective gains was located for only 3% of the products. The data regarding evidence of cognitive and affective gains should be interpreted cautiously since they were based solely upon the reports and documents the developers elected to send. No attempt was made to initiate a thorough search since doing so was outside the scope of the study.

Contributions Toward Goals Through Facilitating Factors

The nominator of each product was asked to indicate whether or not the product contributed to acceptable educational goals through one or more of the facilitating factors (i.e., organizational efficiency, classroom climate or operation, learning procedures or methodology, or perceptual-motor skills). In addition, as with measured gains the project staff attempted independently to verify the contribution towards goals by reviewing documents supplied by the developers of the products. It may be recalled that in order to meet the effects criteria by which products were selected, a product had to have produced results which suggest a measurable gain, or to have contributed toward one of the facilitating factors. For most of the products the nominator didn't know if the product had contributed to one of the facilitating factors. "Don't know" was marked for 85% of the products for organizational efficiency, 67% for classroom climate or operation, 64% for learning procedures or methodology, and 81% for perceptual-motor skills. Here, also, as with measured gains, there was very little evidence available in the documents in hand to support that the products so rated actually did contribute to the facilitating factors.

Type of Developer

Developer simply refers to the type of organization primarily responsible for the development of the product. About half of the products (47%) were developed by government agencies or regional laboratories and centers. About one-fourth (27%) were developed by private non-profit organizations, while the same percentage were developed by profit-making organizations.

Table 12 shows the frequencies and percents of the 117 selected products by type of developer and by focus. Forty-one percent of the products had government as type of developer and a focus on subject matter. Somewhat less than a quarter of the products (23%) were developed by profit-making firms and had a focus on subject matter, while a similar percent of products had a focus on subject matter and were developed by private non-profit organizations. Only the private non-profit type of organization produced products that focused on organizational efficiency; these numbered only three.

Table 13 shows the frequencies and percents of the 117 selected products by type of developer and by content. There was no consistent pattern across type of developer or across type of content, but there was some tendency for profit-making organizations to stress products with a language content (15%). Government groups seemed to have some tendency to stress science and social studies products (18% and 19% of the products, respectively), as did private non-profit organizations (13% and 15%).

Location of Developer

Location of developer refers to the section of the United States where the product was developed. The sections or divisions were based upon the accepted U.S. Office of Education regional divisions of the United States. The frequencies and percents of the 117 selected products by location of developer are shown in Table 14. Developing organizations tended to be located more frequently in the northeast (54%) and west (30%). As seen in Table 15, while products developed in the west frequently tended to be products of government agencies or regional laboratories (19%), products developed in the northeast were about equally distributed among the three classifications of developing organizations (16% government, 18% profit-making, and 20% private non-profit).

Characteristics of the 21 Selected Products

Characteristics in Terms of the Additional Selection Criteria and Constraints

As noted in the Method section above, the following selection criteria and constraints were applied to the pool of 117 products to determine the final list of 21 exemplars: focus, format, grade level, extent of use, reported gain, visibility, and type of developer. Table 16 shows the distribution of the 21 products across these criteria and constraints. Nine products focus on language, seven on mathematics, seven on science, eight on social studies, three on vocational education, and four on one or more of the facilitating factors. Products were selected to represent both comprehensive formats with many types of media and limited formats. Seventeen products had high extent of use (i.e., were in use in more than 100 schools), three moderate use (25 to 99) schools), and one low extent of use (5 to 24 schools). For evidence of student gain, 11 products were rated high, eight moderate, and two low. (See Method section "Initial Selection of Exemplary Products" for basis used in rating gain.) Five products had high visibility and 16 moderate visibility as rated by the project staff. A government agency developed nine of the products, while seven were developed by private non-profit organizations, five by profit-making firms. (As noted on Table 16, the data reported in this paragraph are not necessarily consistent with subsequent tables since product selection was based upon information from nominators rather than results of the later case studies.)

List of the 21 Exemplary Products

The following is a list of the 21 products selected using the additional selection criteria and constraints. Their developers and the location of the developing organizations are also shown. These are the products for which complete case studies were prepared (see Appendix H), and whose characteristics are reported below.

1. Arithmetic Proficiency Training Program (APTP); Science Research Associates, Inc.; Chicago, Illinois.

2. The Cluster Concept Program; The University of Maryland, Industrial Education Department; College Park, Maryland.

3. The Creative Learning Group Drug Education Program; The Creative Learning Group; Cambridge, Massachusetts.

4. Developmental Economic Education Program (DEEP); Joint Council on Economic Education, in cooperation with its Affiliated State Councils and Centers for Economic Education; New York, New York.

5. Distar Instructional System; Siegfried Engelmann & Associates, University of Oregon; Eugene, Oregon.

6. Facilitating Inquiry in the Classroom; Northwest Regional Educational Laboratory; Portland, Oregon.

7. First Year Communication Skills Program; Southwest Regional Laboratory for Educational Research & Development; Inglewood, California.

8. The Frostig Program for Perceptual-Motor Development; The Marianne Frostig Center of Educational Therapy; Los Angeles, California.

9. Hawaii English Program; The Hawaii State Department of Education and the University of Hawaii; Honolulu, Hawaii.

10. Holt Social Studies Curriculum (Discovery Approach to American History); Carnegie Social Studies Curriculum Development Center, Carnegie-Mellon University; Pittsburgh, Pennsylvania.

11. Individually Prescribed Instruction--Mathematics (IPI--MATH); Learning Research and Development Center, University of Pittsburgh, Pittsburgh, Pennsylvania; Research for Better Schools, Philadelphia, Pennsylvania; Appleton-Century-Crofts, Inc., New York, New York; Baldwin-Whitehall School District, Pittsburgh, Pennsylvania.

12. Intermediate Science Curriculum Study; The Florida State University, Intermediate Science Curriculum Study Project; Tallahassee, Florida.

13. Materials and Activities for Teachers and Children--The MATCH Program; The Children's Museum; Boston, Massachusetts.

14. Program for Learning in Accordance With Needs (PLAN); American Institutes for Research and Westinghouse Learning Corporation; Palo Alto, California.

15. Science--A Process Approach; American Association for the Advancement of Science; Washington, D. C.

16. Science Curriculum Improvement Study; Science Curriculum Improvement Study Project, University of California; Berkeley, California.

17. Sesame Street; Children's Television Workshop; New York, New York.

18. The Sullivan Reading Program; Sullivan Associates; Menlo Park, California.

19. The Taba Social Studies Curriculum; The Taba Social Studies Curriculum Project, San Francisco State College; San Francisco, California.

20. The Talking Typewriter or The Edison Responsive Environment Learning System; Thomas A. Edison Laboratory, a Subsidiary of McGraw Edison Company; Englewood Cliffs, New Jersey.

21. Variable Modular Scheduling Via Computer; Stanford University and Educational Coordinates, Inc.; Sunnyvale, California.

Brief narrative descriptions of these 21 products can be found in Appendix D. Appendix G contains a detailed description of the 21 exemplary products; this description is in the form of a matrix of products by the data elements used on the Product Data Record (described in the Method section above). The quantified characteristics of the 21 exemplary products as described below are based upon data in Appendix G.

Product Descriptions

Product characteristics. This section includes information on type of developer, type of distributor, focus, grade level, and target population of the 21 exemplary products. The data were obtained primarily from the product developers during the case studies. There was more than one developer in some cases, although ordinarily one agency or organization alone was responsible for each of the products studied. Type of developer included: regional laboratory; R&D center;

university; other government (which refers to county, state, public school district, or military agencies who may have been the primary developer); private non-profit (which refers to such groups as AIR, who have developed the product even though under government funding); and profit-making (which usually refers to commercial publishers who are set up to make profits).

Table 17 shows the frequencies and percents of the 21 exemplary products by each type of developer. Most frequently, universities, private non-profit organizations, and profit-making organizations were the developers (38%, 33%, and 29%, respectively). It is interesting to note that in no case did an organization classified other government (e.g., a school district) develop a product by itself. A third of the 21 products were developed by two different types of organizations working together. In interpreting these results, it should be recalled that type of developer, as classified for the 117 products, was considered in selecting the 21 exemplary products.

Table 18 shows the frequencies and percents of the 21 exemplary products by type of disseminator. Type of disseminator refers to the kind of organization currently disseminating information about the product or intending to take this as a continuing responsibility. It does not refer to organizations who disseminated the product in the past and then quit. Dissemination refers to any of the channels by which information about the product and its use was brought to the attention of potential users, and not necessarily to sale of the product. For a third of the products there were more than one type of organization doing the dissemination. The dissemination of about 71% of the products was by a profit-making organization: by itself, 38%; with a university, 14%; or with a private non-profit organization, 19%. As might be expected, none of the 21 products were disseminated by R&D centers. Universities were disseminators only in partnership with a private profit-making organization (14%). One of the 21 products, The Cluster Concept Program, had no disseminator; 62% were disseminated by one organization, while 33% were disseminated by two organizations.

Table 19 shows the frequencies and percents of the 21 exemplary products by type of focus. Focus refers to the major influences of the product as they affect students. Focus could be on one or more of the following: subject matter; organizational efficiency; classroom climate or operation; learning procedures or methodology; or perceptual-motor skills. Subject matter refers to language, mathematics, science, social studies, or vocational education. Organizational efficiency refers to ways of arranging the classroom, the schedules, time, space, and structure, etc. Classroom climate or operation refers to ways of changing operations or interactions among students or between students and teacher within the classroom itself. Learning procedures and methodology include ways of presenting information or getting students to ask questions, etc. Perceptual-motor skills refers to a particular skill area. A prime example is probably that of the Frostig perceptual-motor skills program materials that teach visual and visually-oriented motor coordination.

It may be seen in Table 19 that about half of the 21 products focused only on subject matter, and about one-third on subject matter and learning procedures. No product focused only on classroom climate or operation, or only on learning procedures or methodology. However, 38% of the products included learning procedures or methodology as a focus. Subject matter was included as a focus for 86% of the products.

In interpreting the data on focus for the 21 products, it should be noted that focus was one of the items considered in selecting the 21 products. It is, nonetheless, interesting to compare the results in Table 19 with Table 1, which shows focus of the 117 products. Both tables show similar percents (within 3%) for subject matter, organizational efficiency, classroom climate, and perceptual-motor skills. However, for the 117 products, 10% had learning procedures or methodology as a focus, whereas for the 21 products 38% did. This may simply reflect the fact that project staff learned more regarding the details of the products studied than was available to the nominators of the 117 products.

Grade level of the 21 exemplary products is presented in Table 20. Grade level simply refers to the grades (i.e., K-12) in which the product is being used. The only products that were designed for a single grade level were for kindergarten. These were the First Year Communication Skills Program and Sesame Street. Three products span kindergarten through grade 12: DEEP, the Hawaii English Program, and Variable Modular Scheduling. About three-fourths of the products were designed for grades 1 or 2, while only 29% were designed to include grade 10. One product, the Cluster Concept Program, was designed for grades 11 and 12 only. The data in Table 20 differ, in a number of cases, from data on the 117 products shown in Tables 6 and 7. This may have been the result of having used grade level as one of the items considered in selecting the 21 products.

The last product description is concerned with percent of target population. Percent of target population is the intended percentage of all students in the U.S. at a given grade level that a product is aiming for, as recorded by the product developer. Most of the products (90%) investigated were intended for 100% of the target group. One product, Holt Social Studies Curriculum, is designed for average and college-bound high school students, or the upper 75% of the students. The Cluster Concept Program was designed for 40% of grades 11 and 12 students--those who typically would enroll in vocational education courses or in the general curriculum rather than in college preparatory courses, but who want some occupational preparation while remaining in the mainstream of the educational program. Generally, the percents of target population reported by the developers of the 21 products were equal to or higher than those reported by the nominators of the 21 products, as may be seen by comparing Appendices E and G for the 21 products. (Data for all 117 products are shown in Table 8.)

Objectives of product. The objectives of the product were the objectives that the product was designed to help students or school personnel achieve. Table 21 shows the frequencies and percents of the 21 exemplary products by the degree of specificity with which the product developers laid out actual student performance objectives, as rated by the project staff. About two-thirds of the products had specific objectives (29%) or very specific objectives (38%). Nineteen percent had somewhat specified objectives, and 14% general objectives. No product developer had specified only very general objectives.

Description of materials. The format of a product refers to the mode in which information is presented; e.g., through textbooks, television, or laboratory equipment. A product might have one or more of the various types of formats. Table 22 shows the frequencies and percents of the 21 exemplary products for each type of format. All products included some type of paper format such as textbooks, workbooks, manuals or guides, or tests. However, only three products (14%) used paper products only, but none used only textbooks or only workbooks or only tests. Although about half of the products used an audio-visual format (i.e., television; films including slides, strips, and movie; and audio records and tapes), none used only this format. Sesame Street, for example, uses both television and manuals. Kits (charts, maps, models, games, or laboratory equipment) were used in 71% of the products, but always in conjunction with at least paper products. Over half of the products (52%) used displays such as charts, maps, and models. Three products (14%) used the computer: the Arithmetic Proficiency Training Program, which also used paper products and kits; Project PLAN, which also used paper products, audio-visual, and kits; and Talking Typewriter, which in addition to the computer used paper products and audio-visual. The data in Table 22 are not comparable to those shown in Table 5 for the 117 selected products. However, format was one of the items considered in selecting the 21 products from the pool of 117.

Table 23 shows the frequencies and percents of the 21 exemplary products in terms of the format of materials used in training personnel. All products except one, the Creative Learning Group Drug Education Program, had teacher training materials, although this product does provide a teacher's manual for use in the classroom. Similar to Table 22, almost all (95%) of the training materials included a paper format, and about half (57%) used an audiovisual format. However, only about a fourth used a kit. The computer was used as a format for presenting training in only one product, Project PLAN. All but nine products used more than one format, and eight (38%) used only paper products. All products but three used manuals or guides as at least one of the formats for teacher training materials.

Subject matter content of a product, as shown in Table 24, refers to which of the five major content areas (i.e., language, mathematics, science, social studies, or vocation education) the product was designed for. Only two of the products were designed for vocational education, the Cluster Concept Program and DEEP, and one of these (DEEP) in conjunction with social studies. The percentage of products designed for the other four major content areas varied from about one-fourth to about two-fifths; 38% for language; 29% for mathematics, 24% for science, and 33% for social studies. About 24% of the products were designed for multiple content areas, while two of the 21 exemplary products had no subject matter content. These two were Facilitating Inquiry in the Classroom and Variable Modular Scheduling. As mentioned above, subject matter content (in conjunction with focus) was one of the items considered in the selection of the 21 products. A comparison with Table 3, which shows subject matter content of the 117 selected products, reveals roughly similar percents for language, mathematics, and vocational education. However, the 21 products contained a lower proportion of the products with science or social studies content than the original pool (24% vs 39% for science, 33% vs 42% for social studies).

The cost of the product to the user refers to how much it costs the user per student per year, in dollars, to use the product; typically this means purchasing the product. In estimating the cost per student, members of the project staff considered the life of non-consumable materials to be five years. For materials which come as one per class, the cost was divided by 30 to arrive at the per pupil cost. If materials were designed to be used on a sharing basis in a number of classrooms, realistic maximum utilization of materials was assumed. Table 25 shows the frequencies and percents of the 21 exemplary products by cost per student per year. For four of the products, it was not possible to determine the cost to the user. These products were the Arithmetic Proficiency Training Program, Cluster Concept Program, DEEP, and the Taba Social Studies Curriculum. About half of the products cost the user five dollars or less per student per year. About 20% of the products cost the user from $30 to $200 per student per year. Thus, the cost of the 21 exemplary products covered a very wide range, from $1 to $200 per student per year. Products costing $1 per student per year were Facilitating Inquiry in the Classroom, the MATCH Program, and Sesame Street. The Talking Typewriter is at the other end, at an estimated $200 per student per year.

Period of student use. The period of student use was quantified as either the total number of hours within a semester during which the product is used, or, if the product is designed only for two or three weeks, the total number of hours for the product's application. In Table 26, the frequencies and percents of the 21 exemplary products by period of student use are shown. About one-third of the products were designed for continuous use for 20 to 50 hours per semester. About one-fourth were designed for continuous use for 80 to 130 hours per semester. About 14% of the products were designed for continuous use for more than 130 hours per semester. The product with the longest continuous use, over 400 hours per semester, is Project PLAN. Only two of the products were designed for non-continuous use: the Arithmetic Proficiency Training Program and the Talking Typewriter (where the period of use depends upon the child). Period of student use was not applicable for three products: DEEP, Facilitating Inquiry in the Classroom, and Variable Modular Scheduling.

Other product descriptions. Another product descriptor is parent/community involvement, which refers to whether the product provides in its instructions for some parent or community involvement during the use of the product. Each product was classified by the staff using a five-point rating scale of no provisions, few provisions, some provisions, many provisions, and extensive provisions. More than three-fourths of the products made no provisions or only a few provisions for parent/community involvement. One product provided some provisions, four products many provisions, and no product provided extensive provisions for such involvement.

The degree of specificity of assessment measures was also considered. It refers to the degree to which specific criteria were developed by the product developer to assess student achievement. This was usually related to the degree to which the developer specified student performance objectives. Products were classified on this variable by the project staff using a five-point scale of none, little, some, much, and very much. Over half of the products included assessment measures which were highly specified.

Product Origins

Key personnel. Key personnel were defined as those individuals whose involvement was critical to the development of the product, as judged by the project staff. As seen in Table 27, the number of key personnel ranged from one to 16. About two-thirds of the products had three to six key personnel, while about one-fourth had seven to 16 key personnel. The remaining three products had only one or two key personnel. Using the total cost of getting a product from its origin to the users as a general index of the size of a project, there does not appear to be any appreciable relationship between the size of a project and the number of key personnel. For the Sullivan Reading Program, three key personnel were identified; DEEP had four; Project PLAN had eight; Sesame Street 14; and the Hawaii English Program 16. The total costs for the Sullivan Reading Program and the Hawaii English Program were about the same.

An attempt had been made to determine the number of years of experience of key development staff, but sufficient information was not available. Table 28, however, shows the number of key development staff for the 21 exemplary products with doctorates. The number ranged from zero to 12. Sixty percent of the products had one to four key personnel with doctorates, while two products had no key personnel with doctorates. Nineteen percent of the products had five to seven key staff with doctorates, while two products, the Hawaii English Program and IPI, had 12. The percent of key staff that had doctorates ranged from zero to 100%, with an average of 60% over the 21 products. The products for which all key development staff had doctorates were the First Year Communications Skills Program with six, IPI with 12, Intermediate Science Curriculum Study with six, and Science--A Process Approach with five.

In Table 29 the composition of the key developmental staff for the 21 exemplary products is presented. Staff specializations used were: teachers (elementary and secondary); college faculty members; administrators; and R&D personnel not classifiable in one of the previous three categories. It may be seen that about three-fourths of the products were developed by a staff of more than one type. Seventy-one percent of the products had R&D staff as key personnel, while 57% of the products had college faculty, and 52% administrators. Only two products, Facilitating Inquiry in the Classroom and Taba Social Studies Curriculum, had teachers as key personnel; this does not mean that teachers helped in the development of only two products, but that teachers were key personnel in only two products. None of the 21 products had only teachers or administrators as key staff. Four products (i.e., 19%), however, had only R&D personnel as key staff. The two products with only college faculty members as key staff were the Cluster Concept Program and the Sullivan Reading Program.

When the data in Appendix G used to prepare Table 27 were compared with data used for Table 29, it was found over the 21 products that on the average 2% of key staff were teachers, 37% college faculty, 11% administrators, and 49% R&D personnel.

Sources of ideas for product. Data for the 21 exemplary products were collected related to the determination of user needs; that is, how the developer actually went about determining the needs of the user for a product before it was developed. Table 30 shows the frequencies and percents of the 21 exemplary products for each of four methods of determining user needs. For all products, user needs were assessed by at least making an educated guess based on past experience. Knowledgeable people were asked or the literature reviewed to determine user needs for 85% of the products. For 43%, a sample of potential users was observed or asked; while for 24% of the products, performance measures were used. The most frequently used combination of methods was the educated guess plus asking knowledgeable people or reviewing the literature (43%). For 19% of the products all four methods of determining user needs were used. Those products were the Frostig Program for Perceptual-Motor Development, the Hawaii English Program, Science Curriculum Improvement Study, and Sesame Street. User needs were never determined solely on the basis of asking knowledgeable people, observing user samples, or performance measures. As mentioned, there was always an educated guess based on past experiences.

Funding for product. About 48% of the products were developed with funds from the government, 24% with private funds, and 28% with both government and private funds. The frequencies and percents of the 21 exemplary products by total cost to get the product from origin to user are shown in Table 31. Total costs ranged from $50,000 for the Creative Learning Group Drug Education Program to $14,000,000 for Sesame Street. About half of the products had cost $2 million or more each by the time they reached the user. About one-fourth of the products cost less than a half million dollars by the time they reached the user. For most of the products these total costs could not be broken down by the developers into costs for development, evaluation, and diffusion, so a cost breakdown could not be made. No cost information was available for three products: the Distar Instructional System; Frostig Program for Perceptual-Motor Development; and IPI.

Product Development

Number of organizations that participated in product development. In determining the number of organizations that participated in product development, only those organizations that were responsible for development of the product and made major contributions in terms of actual development activities were included. For 57% of the products there was just one organization involved in the development; for 33% there were two organizations; for one product, the Sullivan Reading Program, there were three; and for DEEP there were four. The percent of each organization's resources used for product development was initially a matter of interest but was later omitted since the information was not usually available from the product developers.

Actual procedures for development of product. During the case studies, the number of formative evaluation cycles taken for each product was noted. The number of formative evaluation cycles refers to the number of attempts to try out the product, obtain information, and then use that information to make revisions in the product, thereby producing a new phase or model of the product. Of the 21 exemplary products, 29% had one formative evaluation cycle, 19% had two cycles, 29% had three cycles, and 24% had four or more cycles. Concerning the stage at which formative evalution was initiated, as rated by the staff on a five-point scale, none of the developers of the 21 products started formative evaluations very late, 5% (or one product, Cluster Concept Program) started late, 14% started midway, 48% started early, and 33% started very early.

The developers employed various procedures or combinations of procedures during formative evaluation. The procedures used for the first cycle of formative evaluation for the 21 exemplary products are shown in Table 32. Most of the product developers (91%) used multiple procedures during this cycle. The most frequently used procedure was "development staff observed in use" (91%), while the least frequently used procedure was "development staff taught using the product" (43%). For 29% of the products, all four procedures were used: the two just mentioned plus "asked classroom teacher" and "obtained performance measures." These latter two procedures were used for 81% and 67% of the products, respectively. The procedures "asked classroom teacher" and "obtained performance measures" were never used alone.

Similar information is found for the second cycle of formative evaluation in Table 33. The trends remained approximately the same, except that asking the classroom teacher was the most frequently used procedure. It was used for all 15 products that had a second cycle of formative evaluation. For 27% of the products with a second cycle, all four procedures were used. Similar information is found in Table 34 for the third and subsequent cycles. The trends remained the same as for the second cycle for the 11 products with a third cycle. However, during the fourth and subsequent cycles, there was a tendency for the four procedures to be used at a somewhat more equal frequency for the five products involved, although developmental staff taught using only two of the products.

Generally, the same procedures were employed across the cycles of formative evaluation. Six products had only one cycle. For the 15 that had a second, 12 used the same procedures as for the first cycle, two dropped "development staff taught," and one dropped this procedure and "asked teacher." Considering the 11 products that had a third cycle, nine used the same procedures employed for the second cycle, while two dropped "development staff taught." For the five products that had more than three cycles, four used the same procedures as for the third cycle, while for one product "obtained performance measures" was substituted for "staff observed in use."

Table 35 shows the frequencies and percents of the exemplary products by the degree to which formative evalution data were used to modify the products, in the opinion of the staff. After the first cycle, the degree of modification dropped considerably. During cycle one, 67% of the products were modified very much, 14% much, 14% some, 5% (one product, Facilitating Inquiry in the Classroom) only a little, and no products not at all. For the 15 products with a second cycle, one, Cluster Concept Program, was not modified at all; three were modified some; seven modified much; and four modified very much. The majority of products with a third cycle were modified some: none were not modified or modified only a little, while two were modified very much. Of the five products with more than three formative evaluation cycles, two were modified only a little or some; two were modified much; and one, the Frostig Program for Perceptual-Motor Development, was modified very much.

Summative Evaluation

Large and small scale field tests. The results given in this section were based upon reports of studies supplied by either the product developers or disseminators. They were at times difficult to evaluate and compare since the information reported varied in detail. No attempt was made to review the general professional literature or search other sources since doing so would have been outside the scope of the study. Field tests refer to evaluations conducted after a product was developed to determine its effectiveness. Small scale field tests were defined as those with fewer than 100 students, large scale field tests those with 100 or more students.

Table 36 shows the frequencies and percents of the 21 products by number of field tests conducted. About half of the products that were field tested were field tested only once or twice, and 24% of the products (five products) were not field tested. Several products were field tested three or more times, and reports on six field tests of the

Distar Instructional System were available. Table 36 also shows the number of small scale and large scale field tests, in addition to the total number of field tests. Fifty-seven percent of the products had no small scale field tests, 38% no large scale field tests. The Science Curriculum Improvement Study had five small scale field tests, while the Sullivan Reading Program had four large scale field tests.

Table 37 shows the frequencies and percents of the 21 exemplary products by type of funding source for the major field test for each product. The major field test for a product was defined as that field test with the largest number of students, whether or not it was classified as large or small. Funding sources used in Table 37 are: regional laboratory, R&D center, university, other government (e.g., state or local), private non-profit, and profit-making. About half of the products which were field tested received funding for the major field test from multiple funding sources. Other government funds supported major field tests for 48% of the products.

In comparing the funding source for the major field test with type of developer (as representing funding source for product development), it was noted that for five products the funding souce was the same for both product development and major field test. For four products, other government funds (i.e., state or school district) supplemented the sources used for product development for conducting the major field test. In the case of two products, one developed by a private non-profit organization and the other by a profit-making firm, the major field tests were conducted using only other government funds. These products were, respectively, the MATCH Program and the Talking Typewriter. Product development for IPI was supported by both regional laboratory and R&D center funds, while regional laboratory funds only supported the major field test. For Science--A Process Approach, regional laboratory funds were used to support the major field test, while the product was developed by a private non-profit organization (AAAS). The Distar Instructional System was developed using private non-profit and university funds, whereas the major field test was funded by other government and profit-making organizations. The tendency for other government funds to support field tests is apparent.

As seen in Table 38, the geographical extent of all field tests conducted for the products ranged from one to 11 states, with most products being tested in one to four states. Project PLAN was field tested in 11 states. Information concerning the number of schools participating in all field tests for a product was available for only eight products. The range in number of schools was one to 40 schools; no one number of schools tended to dominate. As shown in Appendix G, information concerning the number of students in all field tests for a product was available for 12 of the 16 products which were field tested. The range in number of students was 15 to 28,000 for Science--A Process Approach. However, half of the 12 products were tested with 1,000 or fewer students. Either one or two organizations participated in the field tests; for 52% of the products, one organization participated. An attempt was made to determine the number of field test staff used in the major field test for each product, but information was available for only three products. Similarly, data on the cost of the major field test were available for only one product.

Product effectiveness. During the case studies, an attempt was made to collect information regarding evidence for measured cognitive and affective student gains resulting from the use of the product, and classes of evidence of sustained cognitive or affective gains. Since the reports available to the staff varied so widely in content and detail, it was impossible to locate sufficient specific information to make quantifying the results meaningful. As a result, data in Appendix G is limited to indicating the number of studies summarized in the Product Development Reports by type of gain or effect. These data are shown in Table 39. Positive gains means the experimental group met the criteria set by the product developer, or the group performed significantly better than the control group. Mixed gains means the experimental group met some of the criteria set by the product developer but not all of the criteria, or the group performed significantly better than the control group on some of the subscales of a test, but not all of the subscales. Negative gains means the experimental group did not perform significantly better than the control group. Data are shown for studies of product effectiveness conducted during product development (hence including formative evaluation studies if they had evidence on product effectiveness) and for large and small scale summative evaluation studies conducted after the product was developed.

As shown in Table 39, for a majority of the products (67% to 86%), there were no studies available that indicated positive cognitive gains. Considering studies conducted during product development, for six products positive cognitive gains were reported in one study, and for one product (Distar Instructional System) such gains were reported in two studies. Four products had positive cognitive gains reported in one large scale field test, one product had them reported in two large scale field tests, and two products (Science--A Process Approach and the Sullivan Reading Program) had them reported in three such field tests. Only three products had positive cognitive gains reported from small scale field tests: for one product they were reported in one study, and for two products they were reported in two studies. Mixed cognitive gains were reported: in one or two studies conducted during product development for four products; in reports of large scale field tests for seven products; and in reports of small scale field tests for one product. There were no studies conducted during product development that indicated negative cognitive gains, but such evidence was reported from a large scale field test of one product and from a small scale field test of four products.

Few studies reported affective gains. Positive affective gains were reported: in one study conducted during product development for the Intermediate Science Curriculum Study; in one large scale field test for IPI, the MATCH Program, and Taba Social Studies Curriculum; and in one small scale field test for two products. The Science Curriculum Improvement Study had positive affective gains reported in two small scale field tests. Mixed affective gains were reported in two studies conducted during product development of the Cluster Concept Program.

Even fewer studies reported evidence of facilitating effects: that is, that a product contributed towards accepted educational goals through school organizational efficiency, classroom climate or operation, learning procedures or methodology, or improved perceptual-motor skills. Positive facilitating effects were reported in one study conducted during product development of both the Frostig Program for Perceptual-Motor Development and Variable Modular Scheduling. Positive facilitating effects were also reported for a large scale field test of Facilitating Inquiry in the Classroom.

In considering results on product effectiveness, the question arises as to whether or not a product is supposed to show cognitive or affective gains. Performing such an analysis would have required classifying each of the goals of all 21 exemplary products, which was not feasible from the information available. In addition, as noted above, data on effectiveness were obtained from reports available to the staff, which did not necessarily cover all of the goals of the products. In many cases studies of affective gains are made for products primarily oriented towards producing cognitive gains. For example, a product may have teaching mathematics as its major purpose, but a study could also have been done to see whether or not a student's attitude towards mathematics changes as a result of using the product.

As an alternative to classifying products in terms of their goals, evidence of effectiveness was considered in terms of the focus of the products: whether or not they focused on subject matter only, the facilitating factors only, or on both subject matter and facilitating factors. These data are given in Table 40, which shows evidence of effectiveness by focus for studies conducted during product development, large scale field tests, and small scale field tests. In Table 40, when more than one study was available for a product, only the one with the most positive evidence was used. For example, if three studies were available for a product showing positive, mixed, and negative gains, respectively, the positive results only would have been considered. Data are also shown in Table 40 considering the most positive evidence for each product over all studies of it, regardless of whether the study was conducted during product development or as a large or small scale field test.

It may be seen in Table 40 that there were seven products with focus on subject matter and facilitating factors. Considering studies conducted during product development, one of these products, Talking Typewriter, produced positive cognitive gains. The Intermediate Science Curriculum Study produced both positive cognitive and positive affective gains. Mixed cognitive gains were found for two products, while for three products there were no reports available regarding studies on effectiveness conducted during product development. Two of the seven products, DEEP and Talking Typewriter, showed positive cognitive gains in large scale field tests; Project PLAN showed mixed cognitive gains; IPI mixed cognitive and positive affective gains; and the MATCH Program positive affective gains. Considering the most positive evidence over all studies for these seven products: the Arithmetic Proficiency Training Program, DEEP, and the Talking Typewriter produced positive cognitive gains; the Intermediate Science Curriculum Study produced positive cognitive and positive affective gains; IPI and Project PLAN resulted in mixed cognitive and positive affective gains; and the MATCH Program produced positive affective gains. There were not reports available that indicated studies of facilitating effects for any of the seven products with focus on subject matter and the facilitating factors.

Table 40 also shows that there were eleven products with focus on subject matter only. For six of them gains were reported in studies conducted during product development. One of these, Cluster Concept Program, produced mixed cognitive and mixed affective gains, while the following five produced positive cognitive gains: Distar, First Year Communication Skills Program, Holt Social Studies Curriculum, Science--A Process Approach, and the Sullivan Reading Program. Six of the eleven products with focus on subject matter only had evidence of product effectiveness from large scale field tests: Distar, Hawaii English Program, Science--A Process Approach, Sesame Street, and Sullivan Reading resulted in positive cognitive gains, while for Taba Social Studies Curriculum there were mixed cognitive and positive affective gains. Either positive or mixed cognitive or affective gains were reported for four of the five products with focus on subject matter when small scale field tests were considered, while for one product negative cognitive gains were noted. (However, this product had produced positive cognitive gains in a large scale field test.) When considering the most positive evidence over all studies for the eleven products with focus on subject matter: Distar, First Year Communication Skills, Hawaii English, Holt Social Studies Curriculum, Science--A Process Approach, and Sesame Street produced positive gains; Science Curriculum Improvement Study and Sullivan Reading showed positive cognitive and positive affective gains; Taba Social Studies Curriculum resulted in mixed cognitive and positive affective gains; and Cluster Concept Program produced mixed cognitive and mixed affective gains. No studies of product effectiveness were available for the Cluster Concept Program. Finally, as noted in Table 40, there were three products with focus on only one or more of the facilitating factors. Considering the most positive evidence over all studies, all three produced positive facilitating effects. Facilitating Inquiry in the Classroom showed these effects in a large scale field test. The Frostig Perceptual-Motor Skills Program demonstrated positive facilitating effects in a study conducted during product development, as did Variable Modular Scheduling. In generally evaluating the data in Table 40, excluding products with a focus on the facilitating factors only, there is no apparent relationship between the focus of a product and the type of evidence (cognitive or affective) of effectiveness.

Extent to which products were modified based upon field test results. The extent to which the 21 exemplary products were modified as a result of the major field test of each product (that is, the field test with the largest sample size) was rated by the staff on a five point scale as shown in Table 41. The judgment could not be made for two products. Of the remaining 14 products that had field tests, the Science Curriculum Improvement Study was not modified at all as a result of its major field test. Seven products were modified only a little, four products somewhat, and two products much. These two products were the MATCH Program and Taba Social Studies Curriculum. No products were modified very much as a result of the major field tests.

Diffusion

Agency participation and diffusion efforts. The marketer or distributor of a product may or may not be the same as the disseminator. In this study marketer was taken to refer to the organization currently doing the selling. Usually this was only one organization, although in a few cases two organizations were concurrently marketing the same product.

Table 42 shows the frequencies and percents of the 21 exemplary products by type of marketer or distributor. (Type of disseminator is shown in Table 18.) As expected, 86% of the products were being marketed by profit-making organizations, usually commercial publishers, but in conjunction with another type of organization for 14% of the products. One product, Cluster Concept Program, had no marketer or distirbutor. For 81% of the products the primary developer was currently disseminating, while for 48% of the products the primary developer was currently handling the marketing.

Diffusion strategy. Table 43 shows the frequencies and percents of the 21 products by type of technique used for dissusion, and when during the development of the product the technique was used. When the technique was used was rated by the staff on a five point scale of very late, late, midway, early, and very early. Diffusion techniques were classified as tell, show, involve, train, and intervene. The diffusion techniques used are nonexclusive, and one product could use all of them. Tell refers to any sort of publication, special paper read, word of mouth, etc. Show usually refers to a demonstration or display. Involve means to have the user participate in some stage of the actual development of the product. Train means to instruct the user about the use of the product in the classroom through, for example, workshops or institutes. Intervene means to exert pressure from levels of authority higher than the user to adopt the product. As seen in Table 43, no diffusion technique was used very late in the development cycle. Intervene was used for only three products: early for Hawaii English, midway for IPI, and late for Sullivan Reading. Tell, show, and train were used more frequently. Tell was used late for one product (Cluster Concept Program), midway for five products (24%), early for nine products (43%), and very early for six products (29%). Show was generally used later in the development cycle than tell: late for two products (10%), midway for seven (33%), early for nine (43%), and very early for two. Only one product, Cluster Concept Program, did not use show. For four products train was not used as a diffusion technique. It was used late for four products (19%), midway and early for six products (29%, respectively), and very early for Science--A Process Approach. Involve was used for 14 products, having been used midway for the Science Curriculum Improvement Study, early for seven products (33%), and very early for six products (29%). In summary, except for intervene most techniques were used midway to very early, with tell and involve being used very early for 29% of the products.

Factors affecting diffusion. Some of the factors affecting diffusion included: the availability of competitive alternative products; the degree of change (on the affective level) required in using the product; compatibility with other school practices; and divisibility of the product. The availability of competitive alternatives refers to whether there are other products in the same content area or with similar approach or foci for roughly the same grade levels. For 33% of the products there was no other competitive alternative available. For 29% there were one or two alternatives available, for 33% there were three to five alternatives, while for one product, the Sullivan Reading Program, there were six to nine alternatives.

Degree of change required refers to how many modifications have to be made in the classroom organization or staff attitudes and functioning in order to use the product. As rated by the staff: Sesame Street required no change on the affective level; 52% of the products required little change; 24% required some change; the Cluster Concept Program required much change; and very much was required for IPI, Project PLAN, and Variable Modular Scheduling.

Compatibility with other school practices was rated by the staff on a four point scale from very compatible to very incompatible. Very incompatible meant that the product conflicts with other ways of doing things in school, probably with teacher approaches and values. A combination of variable scheduling and student selected topics in sex and drug education would be very incompatible to most systems. At the other end of the extreme very compatible meant that use of product requires no real change in classroom organization, structure, or operation. This would occur, for example, if the product was only a slightly different set of materials on a typical topic in a subject area. Three products (14%) were rated as very incompatible with other school practices. These three were Cluster Concept Program, Project PLAN, and Variable Modular Scheduling. Two products (10%) were rated as incompatible: the Hawaii English Program and IPI. Eleven products (52%) were rated as compatible, while five were rated very compatible.

Data were also available about the divisibility of the products, which refers to whether components of the product could be purchased independently and used separately. Eighty-six percent of the products had components that were designed to be used independently, and 81% had components that could be purchased independently.

Adoption

Extent of product use. Extent of product use simply refers to the number of schools and the number of students using the product, and the number of states where the product is being used. Information on the number of schools using the product was available for only nine products; the range in number of schools for these products was 8 to 35,000, this latter for the Sullivan Reading Program. Information on the number of students using the product was available for only 15 products. The range of number of students for these products was 7,000 to 7,000,000 students. The Science Curriculum Improvement Study is reportedly in use by a million students, Sesame Street and the Sullivan Reading Program by five million. The estimated seven million for DEEP is an overestimate; it is the total number of students in the school districts that have adopted DEEP, the actual number of students using the product being unknown. The number of states in which each product is used was known for only 15 products. It ranged from one state for the Hawaii English Program to all 50 states for the Intermediate Science Curriculum Study, Sesame Street, and the Sullivan Reading Program.

Installation procedures. Installation procedures that affect product adoption focused on: the need for special facilities and equipment; the need for classroom modification; the extent of product modification allowed; the need for special teacher training; special teacher training provided; extra staff requirements; the degree of administrative support needed; and the importance of public relations. The need for special facilities and equipment refers to physical things that might have to be bought through the marketer or otherwise in order to use the product. About 76% of the products did not require special facilities and equipment, in the judgment of the staff. The need for classroom modification refers to any reorganization required from the basic 1-30 teacher-centered operation and schedule. This variable was rated by the staff on a five point scale. No classroom modifications were required in the use of the Creative Learning Group Drug Education Program or the First Year Communication Skills Program. Few classroom modifications were needed for 13 products; some modifications for two products; many modificatons for Cluster Concept Program, IPI, and Variable Modular Scheduling; and very many modifications for Project PLAN.

The extent of product modification intended by the developer refers to the extent to which the developer intended to allow the school or teacher to change the product to suit their own needs. Some products were made to be used in a very flexible fashion, while others were pretty much self-contained and inviolable. As rated by the staff, no product modification was intended by the developers of Distar, the Hawaii English Program, and Sesame Street. Little modification was allowed for 10 products (48%), some modification for five. Much modification was allowed for DEEP and Variable Modular Scheduling, while very much was allowed for Facilitating Inquiry in the Classroom.

The need for special teacher training recognized or specified by the developer was also rated by the staff. In part, the need was inferred by the developer's insistance on teacher training. In cases in which the developer recommended it but sold the product irrespective of teacher training, only some need was indicated. No need was a case in which supposedly a self-instructional manual was sold or given to the teacher as part of the product, and no other training was indicated. All products required at least a little need for teacher training. Four (19%) required little, seven (33%) required some, four required much, and six (29%) required very much. These six were: Facilitating Inquiry In the Classroom; Frostig Perceptual-Motor Skills Program; Hawaii English Program; IPI; Project PLAN; and the Taba Social Studies Curriculum.

The availability of teacher training services which the developer was willing and able to provide was also considered. At least a little teacher training was provided for all products. A little teacher training was provided for four products (19%), some was provided for 11 products (52%), and much was provided for four products. Complete teacher training was provided for Facilitating Inquiry In the Classroom, and for IPI.

Table 44 shows the frequencies and percents of the 21 products by type of extra staff requirements. That is, the kind of extra staff required in order to efficiently use the product. Over half of the products did not have extra staff requirements. The use of four required extra supervision (that is, school district personnel such as supervising teacher or assistant supervisor), five required the use of paraprofessionals such as teacher's aids, two required additional teachers, and four required the use of consultants from outside the school district. One product, Talking Typewriter, required the use of all four types of extra staff.

The staff rated each product on the degree of administrative support required, i.e., how much effort the superintendent and principal primarily must exert to install and see that product is successfully adopted. All products required at least a little support. Thirty-eight percent needed little support, 33% needed some, and 14% needed much. The three products needing very much administrative support were Project PLAN, Talking Typewriter, and Variable Modular Scheduling.

The importance of public relations prior to the adoption of each product was rated as minimally important, important, or critical. The rating was based upon the degree to which certain issues are currently sensitive with the public. Public relations prior to adoption were considered minimally important for 24% of the products, important for 57%, and critical for 19%. The four products for which it was judged critical were: Hawaii English Program; IPI; Talking Typewriter; and Variable Modular Scheduling.

Feedback from users. Table 45 shows the frequencies and percents of the 21 products by method employed by the developmental organization, the dissemination organization, and the marketing organization for getting information back from people who have adopted the product. For most of the products (91%) informal collection procedures were used, and it was the only procedure used for 71% of the products. For 24% of the products systematic sampling was used. A survey of all uses was employed for only one product, the Hawaii English Program, which also used the other two methods of obtaining feedback. No methods were used for the Cluster Concept Program.

Future of the Products

Product developers were asked the amount of expected use by 1973, in terms of students. This number could be estimated for only 10 of the 21 products. Estimates for these 10 products varied from 30,000 to 10,000,000 students. The developers of the First Year Communication Skills Program anticipate one million students by 1973, while for Science Curriculum Improvement Study two million are expected. Ten million students are expected to use Sesame Street and the Sullivan Reading Program.

DISCUSSION AND CONCLUSIONS

The reader who has survived the forty-odd tables in the preceding Results section may need a breath of re-introduction to this project and its limitations. The project consists of 21 case studies. The cases were deliberately selected so that subject matter, grade level, and objectives varied among the 21 (to mention a few dimensions; the multiple criteria applied to select the cases are described above and shown in Table 16). The 21 cases, as a set, are in no way a random sample of educational product populations. The sampling was intentionally biased, via the successive criteria, and the small total number of cases was spread across a variety of product categories. Generalizations from such a sample must be handled with care.

The individual case studies, although published separately as Product Development Reports, are an integral part of this report. Each of the 21 Product Development Reports may, however, be read independently. Each represents an empirical base from which hypotheses and tentative generalizations, including and beyond those contained in the present report, may be drawn. The overall project was designed to provide a basis for more definitive studies. The detailed product development histories represent a necessary and significant contribution toward developing more accurate predictions of the potential impact of educational products. The project staff found no comparable case studies. Nor have others who searched the field. Havelock (1971) in his extensive review of innovation in education concludes that the first of five major needs in the area is that "We need more case studies which carefully document and report . . ." (Pp. 11-12) Within this perspective some issues and findings of the current project can be reviewed.

Problems Encountered in the Procedures of the Study

The relative effectiveness of various search procedures used to identify the pool of potential products and the final products for case study was reviewed in the Results section above. Once products were selected, two sources of information were explored: reviewing documentation of the product's history, and interviewing staff who had participated in the development. It was found that most organizations had bulky files of documentation. However, gaps and omissions in both records and memory were frequently encountered. Few organizations were able to provide a detailed breakdown of product development/diffusion costs. Frequently, only gross figures summarizing their organization's yearly budget, or the total of awarded contracts or grants were available. Cost accounting for the various phases of product development is an area for which records are acutely needed.

Commercial publishers tended to be more restrained about giving out information than were staff from universities, research and development centers, regional laboratories, school districts, etc. There seems to have been no established history of open and complete communication regarding product development on the part of commercial publishers. However, to some extent this may reflect naivety on our part inasmuch as the project staff lacked experience in the commercial publishing business and tended to have considerable history of interaction with universities, school districts, regional laboratories, etc.

For several of the early case studies difficulty was experienced in obtaining sufficient documentation in advance so that the initial documentation would be useful to the site team. Requests for documentation were made at least 60-90 days in advance of possible visitation dates. Frequently, such advanced documentation was simply a packet of brochure, non-critical publicity handouts. These were useless. When adequate previsit documentation was not available, site visit teams were handicapped in interviews and wasted a good deal of time in extracting information that could have been more economically gathered through reviewing reports. Frequently, the needed documentation was available in the organization's files. In fact, this was usually the case. However, a number of factors mitigated against its being readily sent: sometimes the documentation was one only and the organization did not wish to spend the reporduction costs; information needed was scattered throughout a number of documents which required an inordinate mailing weight; or the knowledgeable staff had moved on to other projects and were not in close touch with the documentary repository.

The case study procedure used required extensive on-site interviews with the key personnel who had been involved in the development of each product. The 21 exemplary product studies included samples from various organizations across the United States. In most cases, the product had been completed from one to three years previously. Arranging for economically feasible site visits, that is within budget constraints, required continuous schedule juggling: scheduling within a given organization, among the various staff members, and between different development organizations. Typically, the development staff of a given product were involved in other projects at the time of the site interview. They were frequently working for other organizations and in other locations. There were several cases in which the key developer, whose interview was crucial, was working in an entirely different region of the United States.

The schedule did not allow sufficient time and resources for prolonged on-site review of records. Site visitors occupied by far the bulk of their time in interviews with key staff members. Many organizations had large files of supporting documentation. However, little time was available to peruse these thoroughly. In general, project staff had to be satisfied with an overview of the documents, taking copies of those which could be released from the files for careful review at a later time.

A consistent attempt was made during the preparation of every Product Development Report to communicate with the product staff regarding the fidelity and completeness of the report draft. Academic schedules, vacations, and even job changes during this period caused some difficulties. However, each report was reviewed by either the key staff who had been interviewed, or by a staff member designated by the organization. In all cases the draft report appeared to have captured the major events and problems in the product's developmental history--as perceived by the developer. Suggestions tended to focus on appropriate credit to personnel, on toning down a few pungent phrases, and generally on what could be considered details of report. Each draft report was approved by the developer. All developer suggestions related to factual levels of descriptions were incorporated in the final drafts. Suggestions regarding interpretations were given serious consideration.

Possible Biases in the Information Collected

The case studies are based primarily upon information collected from the development/diffusion agencies. All the information was checked as closely as time and availability of records would permit. However, no corresponding amount of effort was devoted to a search among users. In several cases, extensive user information was uncovered. However, this was serendipitous. Some mitigation against the possibility that positive claims about the products have been overblown by developers' reports was the general evidence collected from records of formative evaluations and field tests.

The study was essentially a retrospective historical search. As such, it is subject to all the biases inherent in attempts to reconstruct the past. In all case studies the staff was able to interview several respondents independently. Cross-checks of information revealed few discrepancies, although each member of the development team tended to present different emphases, depending on the interest and special experience of the respondent. There were few instances in which respondents' recollections were refuted by records. Typically, the respondent described the general characteristics of a particular procedure on a product's history and referred the project staff to documentation for detail.

There had been some initial concern, and this was emphasized by the consultants to the project, that the type of interview schedule used could color the results. Early in the project a rather tight interview schedule was proposed which tended to follow a systems development model of product development and diffusion. This highly structured schedule was rejected and an open-ended procedure substituted. Tests of the structured schedule with AIR staff, who had experience in product development, showed that respondents gave professionally desirable answers, i.e., every history followed a tidy systems development sequence. All interviewers were trained on the outline for Product Development Reports contained in Appendix F. However, this was used primarily as a checklist before and after each interview.

Factors Related to Product Development

Four factors related to the development of the 21 exemplary products warrant special discussion based upon a review of the individual Product Development Reports. These are key personnel, funding patterns, time required for development, and formative evaluation.

Key Personnel

The most noticeable attribute of the personnel most directly responsible for the development of the 21 products is the staff mix: a mix of staff experience and professional specialities. This mix is evident in two ways. Over the longer term history of a project there was typically more scientific or research orientation to the earlier investigations than found later. University backgrounds were predominant. Later development efforts by professionals with an instructional technology or systems development background built upon these earlier ideas and findings. This point will be discussed further in the section on funding.

In the actual development of a product, a mix of professional specialities was usually the case. This is true even in the smaller scale projects in which only, for example, three key development staff were identified. The minimal mix appeared to be: content skills often combined with instructional development skills; evaluation and research background sometimes combined with systems development skills; and a user, practical orientation. For example, for Facilitating Inquiry in the Classroom, the working team of three consisted of an experienced inquiry trainer--content, a research and evaluation specialist, and a participant observer who initiated user groups during tryouts. This team was supported by a larger group of varied specialists within the development organization. The Sullivan Reading Program's team consisted of a professor of languages who had spent years learning how to develop programmed materials, a psycholcgist, and a linguist who could write.

There were no one man products among the 21. Often a key mover or driving force could be identified: Joan Cooney in Sesame Street, John Flanagan in Project PLAN, Marianne Frostig in the Frostig Perceptual Motor Skills Program, Alvin Karplus in the Science Curriculum Improvement Study, and many others. They initiated, sustained the project through lean times, and fought for support. As the product was built, these key movers often assumed a major management role. But the development was accomplished by teams--either small or large.

It should be noted that the Results section indicates a product with one key staff member. This was reported for the Creative Learning Group Drug Education Program. The organization is relatively small. The key mover, a very forceful personality, played a major role in all steps of development. However, a team of several members with backgrounds in programmed learning and teaching produced the materials. Similarly, a key staff team of two reported for the Talking Typewriter refers to only the hardware component of the product. The MATCH Program is reported having a key staff of two. There were two movers and originators in this museum based project. However, the MATCH boxes or units were each developed by a separate team, a team of varying backgrounds.

A recurring theme among the small group teams was the difficulty and importance of effective sustained cooperation. The successes were seen, mixed teams that had completed the product. The failures were buried in old personnel records. For almost every product there were casualty lists of staff departures. Beneath the more acceptable reasons for leaving, the AIR site visitors typically found an inability to work with other members. In some cases delays in production could be directly traced to staff discord, resolved by departure of some, followed by replacements. Effective solutions appeared to occur through trial and error, or error and fire. The surviving teams worked together continuously, had frequent informal contacts with one another, and learned a fair amount about each other's discipline, i.e., its approaches, problems, and requirements. However, the AIR site visitors were not geared to systematically identify and explore these group interactions in more depth.

Access to a wider variety of professional input on a part-time base was typical. Large organizations supplied these in-house. Small organizations obtained consultant or part-time services from individuals in other organizations.

The role of teaching and teachers in the development of the 21 products was paradoxical. The products are designed for use by teachers. Yet teachers themselves are not well represented in the key development staff. A number of "reformed teachers" who had become administrators, curriculum advisors, or college staff served on development teams. In several of the larger scale projects, summer writing conferences were employed in which groups of teachers helped to write materials. Teachers and classrooms served an active role throughout most products in giving feedback to prototype versions. In Project PLAN and Science--A Process Approach, for example, teachers assisted in both preparing materials and tryouts, but they were not classified as key development personnel for the purposes of this study. The most extensive role played by teachers was in the early version of the Taba Social Studies Curriculum. Local district staff selected the topic and the project leader, Hilda Taba. Dr. Taba shaped the direction of the project with the assistance of local administrative and curriculum staff, but teachers constructed almost all components of the early product. In the later version of the Taba product, teachers played a more typical and restricted role.

On the other hand, key staff who had no previous public school background frequently plunged into classrooms with prototype products. Edwin Fenton of Carnegie Institute of Technology taught versions of the Holt Social Studies Curriculum to many junior high classes. Dr. Karplus, Professor of Physics at Berkeley, personally taught science units in elementary grades for several years to forge the Science Curriculum Improvement Study. Siegfried Engelmann worked through version after version of what is now Distar in face to face teaching with disadvantaged children in several states. Other products show similar involvement with teaching-learning. For approximately half the products supporting staff working with teachers conducted the early explorations in the classroom.

Funding Patterns

Most products were directly supported wholly or in large part by government sources. The striking success of private enterprise typically occurred when it built on prior development funds supported by federal sources. Science Research Associates invested in Distar following a series of Office of Education investments in preceding versions. Appleton-Century has played an important role in the IPI materials based upon prior and continuing federal support. Private monies entered into the development of other products and into the packaging and marketing of almost all.

No government funds were directly involved in several products. The Creative Learning Group Drug Education Program was built with a shoestring of private backing by a staff claiming first hand knowledge of the topic. In order to bring in desperately needed resources, this product was marketed as a completed product before it was developed. Dr. Frostig has literally spent a lifetime developing the products associated with her name. Her "kitchen table" students are now adults. These were students needing remedial instruction whom Dr. Frostig taught in her kitchen--having no laboratories or classrooms.

In almost all cases of large scale product development, prior work which piloted content, format, method, etc. was utilized. The developers of the Taba Social Studies Curriculum had already done low cost tryouts of their work; Bereither, assisted by Engelmann, had developed and tried the predecessor of Distar; and Suchman had been supported in a series of small scale projects for the development preceding Facilitating Inquiry in the Classroom. These were primarily government funded efforts.

Time Required For Development

The 21 products reflect a relatively long period of development. There are difficulties in many cases in determining when development on the current product started, as opposed to work on a forerunner. A three to five year period of development is typical--exluding time on the prior foundation and/or product. A number of products reveal a five year history from 1966 to 1971--a fertile era, the beginning of which coincides with the initial operational year of the regional laboratories. The Arithmetic Proficiency Training Program, the computer based arithmetic program, required five years of intensive work by Science Research Associates. Distar appears to have been underway in the early '60's--a nine year period. The Intermediate

Science Curriculum Study required approximately six years, while Science--A Process Approach took from 1961 to 1968. Massive applications of resources do not appear to shorten development under a five year period--witness the Hawaii English Program and the First Year Communication Skills Program.

Formative Evaluation

The formative evaluation cycles for each product, their number and timing, are presented in Tables 32, 33, and 34. The major inference from these tables is that the 21 products used from one to four formative evaluation cycles. They did have formative evaluations. The extent of these evaluations was, however, considerably greater than what is indicated by the tables. The site visitors recorded the number of "reported formative evaluations." They sought and identified evidence of relatively complete reports--something akin to a weak journal article. There was in addition to these, although inadequately documented and reported, an almost continuous evaluation that occurred in most of the products. Typically, components of the product were worked through with target audiences, and development staff taught, participated, or observed. Records of these activities were kept in a loose fashion. Reviews of the tryout were held almost immediately afterwards. Development staff and participating teachers reviewed problems, apparent achievements, etc., and identified areas for modification. Documentation was of the hip pocket variety, and the evaluation did not emerge later as an identifiable cycle.

For example, the Science Curriculum Improvement Study staff both taught and worked alongside teachers for years doing this sort of tryout and loose evaluation. No one kept a record of the replications of materials tried out and results observed in the several classrooms of the Frostig Learning Center. Fred Newton tried out early versions of the Facilitating Inquiry in the Classroom materials in workshop after workshop, making it difficult to clearly identify the formative evaluation cycles. IPI-Math undergoes a continuous evaluation process through the Oakleaf School, then to the demonstration schools, and on to the pilot schools in the program. The reporting strategy used in trying to quantify the number of formative evaluation cycles tended to underestimate these efforts. In many cases the evidence on which revisions could be made was based on inferences by the development staff, and student performance measures were sketchy. Products which are committed to clear overt performance measures tended to use them in this process, e.g., the Arithmetic Proficiency Training Program, IPI, and Project PLAN. Sesame Street placed major emphasis on the attention getting power of its prototypes. Innumerable sessions were conducted measuring the attentiveness of small children to the screen, and attractive distractors were introduced to measure the holding power of the program. Little of this series of informal experiments emerged as repeated cycles. A recent report concluded that current educational products receive little or no evaluation before being placed on the market (Education USA, 1971). For the 21 products, this was not the case.

Features of the 21 Exemplary Products

Outstanding Attributes

A number of the 21 products presented unique or outstanding attributes that, in the judgment of the AIR staff, should be reported as useful potential strategies for other product developments. It should be emphasized that the following are illustrative. The concerned reader should consult the individual Product Development Reports for a complete account of each product's attributes. Furthermore, these are subjective judgments.

1. The Arithmetic Proficiency Training Program presented a clear strategy of analyzing a series of skills into a hierarchy of sub-skill components, and of arranging materials to teach these skills so that each learner can start at his own level and receive immediate and appropriate feedback.

2. DEEP has a decentralized development system which is individualized for each user group. An emphasis on assisting schools on the process of change has been developed into well defined procedures.

3. Distar has developed a procedure for tryout and revision closely coupled with teacher training that appears both different and strong.

4. The gradual revision of Facilitating Inquiry in the Classroom from a complex and relatively obscure master-disciple internship to an explicit system that can be taught by persons of relatively low experience may be generalized to a variety of products.

5. The Frostig Perceptual-Motor Skills Program revealed an effective and sustained involvement with the target audience in a setting that supported experimentation and revision of materials.

6. The First Year Communication Skills Program illustrates the effective application of instructional technology--a systems development model supported by adequate resources.

7. The Hawaii English Program presents a mobilization of resources within a state to solve a major problem--a massive effort demanding involved cooperation of all educational institutions.

8. IPI--Math has developed a hierarchical network of supporting and participating schools, a linkage system that can be generalized and exported to other areas.

9. The Intermediate Science Curriculum Study carefully planned a diffusion sequence that was coordinated with, and helped to shape, product development from its initial stages.

10. The MATCH boxes show a way to package and deliver beauty and cultural heritage.

11. The potential scope of individualization of instruction using available materials is shown by Project PLAN. The development of specific performance objectives, accompanied by achievement measures, across all subject areas reveals what can be done.

12. Sesame Street has led the field for educational television in ways that are obvious to most readers. Their intensive promotion-diffusion effort is not as well know and scrutiny of it will be rewarding.

13. Science--A Process Approach offers useful guidelines on the mobilization of a scientific community to determine the needs for and feasibility of product development.

14. The Science Curriculum Improvement Study reflects the effect of direct involvement of development staff in early classroom tryouts. The target audience substantially shaped the development of the product.

15. The Sullivan Reading Program presents an array of diffusion approaches, allowing numerous options to potential users.

Weaknesses of the Products

This section again is based upon the subjective judgments of the AIR staff. The alleged weaknesses are presented, not as criticisms of any product or organization, but as potential red flags for other product developers.

1. The lack of carefully planned diffusion strategies to accompany product development was evident in the history of a substantial number of the products. "Diffusion occurs after development and is largely planned afterwards" summarizes this approach. The contrast with products whose diffusion had been made part of the original development plans and had been coordinated with development is obvious in the case studies.

2. The development of high cost systems based upon special equipment not ordinarily found in schools has resulted in problems for several products. More involvement of potential users and sensitiveness to user constraints appears called for in planning and development.

3. Several products ran aground when the developer began making arrangements for marketing. Units had been hand built in development. In small numbers, the expense of individual units had not totaled to a large sum. Subsequently, it was found that the materials were not suitable for low-cost mass production. The alternatives were substantial changes which may affect the quality of the product, or price the product off the general market.

4. A number of products were completed without assessment techniques for users. As demand became evident, assessment devices were added. These post hoc techniques appeared of little substance or usefulness.

5. In several large scale efforts substantial resources were expanded in early development without any apparent tryout and feedback. Tryouts were conducted, but after many months and dollars had gone into development. Results of the tryouts pointed to costly revisions.

6. The lack of field tests for a number of products has been noted in the Results section. Provisions for field tests were not included in plans or funding. As the products reached completion, the need to make them available tended to overcome any perceived need for field testing--unless it had been provided for in earlier phases of development.

Products With Attenuated Impact

If the product sample for this study had been sufficiently large, some failures might have been included along with the apparent successes. What factors operate in the case of products that met criteria, at one time at least, but now show signs of losing impact or not attaining potential? There is some evidence that a sample of such products is included in the project.

The Cluster Concept Program is a vocational education product developed primarily by university staff in a department of industrial education. The products's developmental history is similar to that of others in the sample with one prominent exception--no arrangements had been made, nor resources allocated, for diffusion. When the product was completed and had been evaluated for effectiveness, the developers searched for diffusion support. In vain. No support was located and no useful base for diffusion had been developed previously. The project appears to be headed for a long dry storage. Actually, several other products made relatively late arrangements for diffusion, but the others were able to generate rescuing support.

The Talking Typewriter presents a cyclical history. The original product, developed by Omar K. Moore in the late '50's, received broad dissemination coverage but was never developed for general use. Moore used it for his own research on learning. Later the product, or rather the hardware, was refined substantially by the present developers.

It was completed and made available for general use without software. Initial efforts met with no success. The product appeared destined for the shelf. An allied organization was formed to select and develop appropriate software. After a period, adoptions began to increase. The product now appears to be making at least a moderate impact.

The MATCH Program, the contribution of the Children's Museum in Boston, captured the hearts of the AIR site visitation staff. Where else can a child worship at a Japanese altar, complete with ancestor tablet; or use real knuckle bones in the manner of the ancient Greeks? Yet, the MATCH boxes, the self-contained multi-media units, may be destined for a local role only. The materials, which include Grecian urns, Eskimo boots, mounted birds, and falconry equipment, have not lent themselves to commercial manufacture. Some authenticity had to be dropped, e.g., the prototype version used real knuckle bones obtained from a local slaughterhouse and then boiled in a staff member's kitchen. Circulation of the MATCH boxes to Boston schools is brisk. Sales to schools at $500 per kit and interest by other museums has been low. Diffusion strategies were never given a substantial place in the development. After the boxes were developed to meet the exacting standards of the developer, diffusion activities and commercial linkages were initiated--unfortunately, perhaps too late.

Generalizations of Findings to Current Hypotheses Regarding the Process of Innovation and Change

The burgeoning literature on diffusion and change does not include any proportionately growing amount of case materials. It was hoped that the present 21 empirically based case studies would shed some light upon current hypotheses concerning innovation and change processes. It is felt that they do. The reader is cautioned that the selection criteria used, the search strategies employed to identify products, and the actual procedures in collecting case study information may have resulted in a non-representative sample of innovative products. Furthermore, the information available from the Product Development Reports does not cover all of the major current hypotheses on innovation and change. It was not possible to get evidence bearing on a number of these hypotheses. In addition, relevant evidence is frequently of a low grade character. Often it represents a retrospective estimate by the developer and/or the AIR project staff and is only tangently supported by a documented or hard data. However, keeping these serious limitations in mind, some of the major notions related to the change process can be examined in light of what these 21 case studies do indicate.

Hypotheses Regarding the Characteristics of an Innovation

Those characteristics of an innovation associated with its likelihood of adoption which are most often repeated in the literature include compatibility, complexity, divisibility, trialability, and relative advantage (Rogers, 1962; Rogers & Shoemaker, 1971; Burnett, 1953; Glaser, 1967; Havelock, 1971).

Compatibility. Compatibility has been defined by Rogers (1962) and Rogers & Shoemaker (1971) as "the degree to which an innovation is consistent with existing values and past experiences of the adopters." The hypothesis is that the more compatible the innovation, the more likely it is to be adopted. This compatability, according to the hypothesis, may be located in the innovation's degree of consistency with the potential adopter's values or his needs, or in his past experience and/or previously adopted ideas. As thus stated, the hypothesis provides an extensive range within which to locate points of fit or non-fit. Although often categorized as an attribute of the innovation itself, compatibility actually resides in the perceptions of the potential adopting audience--according to those who espouse the hypothesis. User perceived compatibility is the concept.

Evidence cited for the hypothesis is usually a description of an innovation that failed; upon post hoc analysis the innovation then appears to have been incompatible with one or more user values or experiences. One wonders what a similar search among "successful" innovations would uncover. Evidence regarding the 21 products is less than firm inasmuch as no direct measures of user perceptions were included in the study. No clear cut dramatic case of adoption failing because of a value contradiction, as often cited in the cross-cultural literature on adoption, was found.

Signs of value conflict were occasionally uncovered. For example, Distar's highly structured teaching is antithetical to many teachers. The programmed text approach of Sullivan Reading was at least formerly if not currently in conflict with some views on teaching. A number of the products were based upon a student inquiry, self-directed learning approach. Although this approach may be valued in the abstract, teacher training experiences indicated that much of what is entailed is not compatible with what is valued in practice by many users. The open discussions emphasized by the Creative Learning Group Drug Education Program appear to be uncomfortable, if not incompatible, to a number of users. The MATCH Program has emphasized nonverbal learning and has encountered signs of value priority differences, if not incompatability. Comprehensive approaches to individualization appear to be applauded as a concept, but require administrative and teaching behavior changes that are not altogether congruent with existing patterns.

As previously indicated, the current case studies were unable to obtain systematic or large scale data from adopters. Thus, on degree of compatibility the products were judged by the developer/disseminator staff interviewed and by the AIR site visitors. The most readily available indicator of compatability was the degree of change required by the product--organizational change or change required in staff behavior. The change may vary from a simple addition to a reorientation of basic values and approaches.

The 21 products appear to cover a broad range of compatability on this measure. Variable Modular Scheduling is not compatible with the current daily class pattern of most schools. It requires extensive changes by administration and staff. The complete individualization of instruction required by Project PLAN and IPI are quite incompatible with usual practices. To a lesser degree a number of the products demand extensive behavior changes from teachers. Facilitating Inquiry in the Classroom, Holt Social Studies Curriculum, and Science--A Process Approach are examples of products that require teacher skills that must be provided by special training. Approximately 80% of the products are accompanied by more or less required specialized teacher training. The other 20% either recommended or offered optional training.

On this evidence, which points more towards incompatability with experience than values, the products cannot be regarded as highly compatible with current education. They reflect a tendency to forge ahead, or diverge from the existing, and to have procedures designed to bring the users along.

Complexity. "Complexity is the degree the innovation is difficult to understand and use" (Rogers, 1962). The hypothesis is that the complexity of an innovation is negatively related to its adoption (Rogers, 1962; Rogers & Shoemaker, 1971). At least three aspects of complexity have been delineated: the number of components in the product; the number of skills required before adoption; and the number of procedures required for maintenance. Complexity appears to be somewhat confounded with compatability. A product may be incompatible by requiring skills beyond those presently exercised by adopter staff. The requirement of training to develop these skills adds to its complexity.

Specialized teacher training is perhaps the most consistent factor contributing to complexity of the 21 products. All products required or recommended some teacher training. This has been discussed under Compatability.

The number of components identified within each product varied extensively. In the more complex products, e.g., Project PLAN, the Hawaii English Program, and IPI, AIR staff did not enumerate each specific component on a detailed level. The number appear to be awesome. Installation of the Talking Typewriter and the Arithmetic Proficiency Training Program require highly complex man-machine arrangements. Approximately one-third of the products are relatively complex in both number of components and installation procedures. DEEP requires an extensive planning activity involving the entire school district. On the other extreme, Sesame Street requires a TV set. A number of the products require only a student and teacher text for their minimal version. Holt Social Studies Curriculum and the Intermediate Science Curriculum were intentionally designed to present a low complexity profile to users. In a similar fashion to their relationship to compatability, the 21 products extend across a broad range of complexity.

Divisibility. The hypothesis is that the more divisible a product the more probable is its adoption. Divisibility may refer to any of several attributes of the innovation. The following have been classified as examples of divisibility: opportunity to try the innovation before adoption, being able to adopt the innovation piecemeal rather than all or none, small scale adoption, and divisibility of decisions to adopt in which group consensus is not required for adoption. Such attributes are sometimes labeled "trialability" (Rogers, 1969), emphasizing the capability of a trial run or a partial or tentative adoption.

Opportunities for a "hands on" trial, a workshop demonstration, firsthand observation of the product in use, etc. are specifically provided for a majority of the 21 products. The Arithmetic Proficiency Training Program, whose computer requirements make it indivisible in other respects, has emphasized demonstration tryouts of the product. Thousands of sample units of the Holt Social Studies Curriculum were distributed. The large scale products such as Project PLAN, DEEP, and the $40,000 Project "Read" off the Sullivan Reading Program displayed marked efforts to involve potential users in the design of custom built versions.

Approximately 80% of the 21 products are divisible in regard to the purchase of separate components. The Taba Social Studies Curriculum can be purchased as simply as one teacher guide. From this, the range extends all the way to Variable Modular Scheduling and The Talking Typewriter which represent an "all or none" product.

Divisibility in the sense of number of decisions required for adoption appears closely related to cost and complexity. Several products required administrative commitment. In others, the cost, ranging from $3 for one manual to over $5,000 for a complete system, would appear to predict the extent of decisions required. Project PLAN, which individualizes most subject areas, and Variable Modular Scheduling require behavior changes by a majority of staff. Presumably a consensus decision is more likely.

In summary, a majority of the products appear to be divisible in one or more senses of the term.

Relative Advantage. "Relative advantage refers to the degree to which an innovation is perceived as being better than the idea it supersedes" (Rogers, 1962). The hypothesis is that the perceived relative advantage of the innovation is positively related to its adoption. Two aspects of relative advantage are stressed economic advantage and social reward. The term is most frequently used to denote relative cost. The hypothesis is that lower adoption and maintenance costs increase the likelihood of the adoption of the innovation.

The cost of installation of the 21 products presented a broad base of variance. Variable Modular Scheduling costs several thousand to install. Project PLAN, The Talking Typewriter, the Arithmetic Proficiency Training Program, DEEP, and the Hawaii English Program present similar high costs. The installation costs ranged downward from these to $100 or less per classroom for Facilitating Inquiry in the Classroom, First Year Communication Skills, and the Frostig Program for Perceptual-Motor Development. The 21 products do not present a consistent picture of initial low cost advantages. Detailed information on maintenance costs was not obtained.

The "social reward" meaning of relative advantage is used to include decrease of discomfort, increase of status approval by others, and expected pleasure. Any or all of those, as perceived by potential users, constitutes relative advantage. Little evidence was found on which to gauge this sense of the hypothesis. All of the products appeared to the AIR staff to possess one or more of such relative advantages. The hypothesis is so multi-faceted it may well be impermeable to most evidence. And, as noted previously, the project did not include measures of the perceptions or attitudes of users.

Additional Hypotheses Suggested by Havelock

The above hypotheses are frequently encountered in the literature. In Havelock's study of innovation and change (Havelock, 1971), several additional hypotheses are proposed.

Linkage. Linkage refers to the degree of interpersonal or intergroup connections and communication between developer/diffuser and user. The hypothesis runs that the more linkages that exist and the stronger the linkages, the more effective will be the utilization of knowledge. The hypothesis suggests that a variety of reciprocal and collaborative relationships between developer and user increase the likelihood of adoption.

The majority of the 21 development organizations show such linkage. They demonstrated a history over a sustained period of time of a wide variety of relatively close contacts with user representatives. Most of the development/diffusion organizations involved were concerned with other products and/or services to users. They had established a multilinear network of various channels of communication. Regional laboratories perhaps present the clearest example of this. Products eminating from regional laboratories tended to be disseminated against a prior background which usually included: regional need assessment; user representatives on advisory boards or directorates; many informal contacts and visits by both groups over a period of time; prior informative training workshops offered by the developer/diffuser to user groups, etc. IPI and DEEP present examples of products in which the linkage system between developer and the network of participating schools for the particular product is elaborate and strong. The interested reader is advised to peruse these case reports. Distar, with a network of demonstration sites tied in to the product, reflects strong linkages. In several cases such as Sesame Street, linkage was built along with the product. The development of the Sesame Street home viewing groups and tutoring programs has established relatively firm ties with user groups.

A few products revealed weak linkages. The Cluster Concept Program appeared to have developed very moderate tie-ins. The Talking Typewriter started with almost none, but has been devoting major effort to establishing such linkages after the product was completed.

In the judgment of the AIR staff, the majority of the 21 products reflect moderate to strong linkages to their intended users.

Structure. From the developer/diffuser perspective structure refers to the degree of systematic organization within the group. Three aspects of structure are included: a division of labor; a coherent view of the user system; and a planned strategy of diffusion. The hypothesis is that the more structure displayed by the developer/diffuser, the more profitable is the adoption of the innovation.

With respect to the first meaning of structure--organized division of labor within the development group--the 21 products present strong support. The specialty mix of staff teams has been discussed previously. In all cases a number of roles and professional specializations were organized into the production unit. Most of the groups had relatively large in-house ranges of specialization which were systematically brought to bear upon the product being developed.

With respect to planned strategy for diffusion, the products clearly vary. Some started such planning early in development; others commenced at field test phases, or later. There were indications that this hypothesis may be confirmed. Although several products which made a flying leap at diffusion appear to be gaining adoption, the several "attenuated impact" products fall in this category. All products for which very early and extensive diffusion planning was found, and these were only four or five, showed solid adoption totals. This should be distinguished from sensitivity to user needs. Product developers frequently displayed signs of openness to user needs which shaped the decision to initiate development. However, little effort was then expended in planning eventual realization of the forthcoming product.

Capacity. This concept refers to a conglomerate of power, sophistication, and status: indications that the developer/diffuser has high capabilities. The hypothesis is that the more capacity displayed by the developer, and presumably as perceived by users, the more likely is adoption.

The large majority of developing organizations manifest relatively high capacity. The R&D centers, regional laboratories, the American Association for the Advancement of Science, etc. reflect capacity and there seems little doubt they would be so perceived by user groups. Only one product appears to emanate from a relatively low capacity group.

Scientific Status. This factor has been treated with caution in the literature (Havelock, 1971). The hypothesis is that the higher the scientific status of the innovation the more probable its adoption. Questions as to the degree of rationality in user decisions coupled with evidence that many mistrust a heavy emphasis on science have led to questions of the importance of this factor.

Apparently the 21 developers of the products had similar questions. Scientific status of the products rests largely upon the reputation of individuals and the developing institution, the extent of systematic effort devoted to development, and a wealth of informal evidence accumulated during tryouts and formative evaluations. As a set, the 21 products do not present a consistently strong position on controlled evidence supporting intended learner gains. Nor does such evidence appear to be a major feature of messages from developers to users, Demonstrated use in relevant settings and objectives were emphasized, not experimental evidence or field test results.

Problems in Assessing The Change Hypotheses

It appears that, when pressured, the hypotheses relating innovation characteristics to adoption retreat to the eye of the beholder. This study collected no direct evidence regarding user perceptions. Presumably, users might either perceive a product as having characteristics that the product lacked, or might fail to perceive existing characteristics of the product. Several of the hypotheses are a bit loose for testing. Some contain such multiple disjunctive concepts in their description of the attributes of an innovation that one would be pressed to find an instance not included.

The variables included in the several change hypotheses are presumed to interact with one another. Each empirical case study should be examined for the simultaneous effect all variables operating, which was outside the scope of the current project. Complexity effects may be balanced by divisibility, increased by low capacity, etc. Rogers & Shoemaker (1971) lists approximately 100 generalizations of approximately the same degree of precision as those discussed above, each containing one or more variables from the diffusion literature. Their simultaneous application to one case may present a problem of interest to others.

It is probably quite obvious that the developer/diffuser may compensate for a hindering attribute of his product by increased efforts stressing other aspects. Thus, the indications that a substantial number of the 21 products were relatively complex may be interpreted as "if such a product is to have substantial impact, this disadvantage must be overcome by compensating attributes or diffusion efforts." The argument is plausible. Sustained energetically it offers the hypotheses virtual immunity from all evidence currently available.

The case studies were compared as a set against each of several change hypotheses. The 21 cases are in many ways a heterogeneous set. They do not differ neatly along any single dimension with other features held tightly in order. They are cases, not experimental treatments.

Conclusions That Appear Supported By the Study

The following propositions appear to have moderate support from the results of the present study. The basis for each proposition has been identified in the Results section or previously in the Discussion.

1. A variety of small scale developmental projects involving instructional innovations of an experimental nature provide a basis for later, more complete product development.

2. A relatively lengthy and sustained application of resources and talent is required for product development.

3. Product development is primarily the work of a staff team representing diverse disciplines and specialization.

4. Formative evaluation initiated early in product development and applied almost continuously was evident in the products studied.

5. Continuous open communication with user representatives is needed throughout the development of educational products.

6. Substantial resources allocated early in product development to the design and development of diffusion strategies are required for effective diffusion later.

7. A number of products did not plan for the design of appropriate measures of effectiveness or make specific provisions for conducting product effectiveness tests. These activities must be provided for early in the development period if any scientifically reputable evidence of product effectiveness is to be obtained.

Identification of Ways Whereby Information on the Impact of Educational Products May Be Obtained

In this section ways whereby information on the impact of educational products may be obtained are noted. Several current systems present information across a wide range of both developing and available products, including information relative to product impact. Through the use of such systems the Office of Education might continuously monitor the impact of educational research and development products.

1. The ALERT (Alternatives for Learning through Educational Research and Technology) system of the Far West Regional Educational Laboratory was noted in the Method section above. ALERT focuses on products that have been tested and can demonstrate their effectiveness. However, to keep the system as relevant as possible, other types of programs are also being included: "maverick" programs that

offer new, unique solutions to primary problems but have not been tested and evaluated; programs that are unique in their coverage of content; and programs that have been widely adopted but whose effect is not yet well known. ALERT attempts to provide sufficient information for the user to make a decision to adopt, reject, or adapt a development.

There are several information sources available from ALERT. One is the "ALERT Recipe Box" which contains punched cards, each representing a curriculum program, organizational arrangement, or other program relevant to schools' needs. The cards are edge-punched according to the program's characteristic features. Basic facts about each program are printed on one side of the card; they include the program name, type, length of use, cost, name and address of developer, etc. An abstract, focusing on the content of the program and classroom activities, is printed on the other side. The purpose of the Recipe Box is to produce a rough identification for further exploration. Other ALERT information sources include: summaries including brochures, folders, and photographs; audiovisual briefings which show the program in action; and reports describing the goals, objectives, content, materials, teaching strategies, implementation requirements, costs, and evaluation of each program.

2. As also noted in the Method section above, the Information Office for the network of R&D centers and educational laboratories publishes the CEDaR (Council for Educational Development and Research) catalog of selected educational development and research programs, projects, and products. The catalog distributed in September 1971 contains summaries of programs listed individually on program sheets. Each program sheet shows the laboratory or center name, the program name, a program abstract, and a list of related projects for which project sheets are provided. The project sheets in turn list the products that resulted from the project. Included on the project sheets are the: project abstract; product outcome (with products classified as research products or technological products); completion dates; name of principal investigator; primary and secondary audiences (i.e., users of product); and a summary of product evaluation. Each project sheet is placed within the catalog under one of thirteen major categories, and cross-references to other appropriate categories are also shown. It is anticipated that the catalog will be updated regularly.

3. Information on educational products is also available from the Educational Products Information Exchange (EPIE) Institute. The purpose of EPIE is to provide its members with information based on studies of availability, use, and effectiveness of educational materials, equipment, and systems. Services are designed to facilitate the making of informed, rational evaluations of products by the consumers. EPIE was established in 1966 to provide up-to-date information on materials, equipment, and systems being produced for instruction, and also to provide guidelines for educators to use in selecting these products. EPIE uses the magazine Educational Product Report (EPR) as an instrument for dissemination of information to subscribers. Each issue centers on one type of product: "hardware" such as projectors and tape

recorders; "software" such as books and films; or possibly a technique, such as team teaching. Each copy of EPR has a matrix summarizing information on a large number of products relating to the theme of the issue. This information is obtained from the producer and is fairly concise. EPR also includes articles which discuss the uses or significance of the type of product being reported, and generally an article either providing guidelines for selection of a product or presenting a model for evaluation of the effectiveness of the product. In a few cases EPR contains user reports or evaluation studies, but in general there is no attempt to evaluate the effectiveness of a product, to describe any one version of the product in detail, or to judge the merits of the different versions of the product.

4. The PARaDE (Products/Accomplishments from R & D in Education) System is currently under development by the Office of Education National Center for Educational Research and Development to identify, catalog, and describe product outcomes of the educational laboratories and R&D centers. One objective of the system is to create a new data bank or information collection which can be used to: respond to management inquiries; interest agencies in laboratory and center products; reply to product information requests; and fill a major portion of the product information needs growing out of a new laboratory and centers evaluation system. A second objective is to reduce the amount of time and effort spent by each laboratory and center in responding to product information requests. A third objective is to provide for the possibility of analyzing and reducing the raw data into a series of publications showing what the laboratories and centers have accomplished.

Information is reported for the PARaDE system on two forms, one for developmental products and one for knowledge products (i.e., products contributing new information to our theoretical and technical knowledge base). Information collected about developmental products includes: a description of the educational problem the product is designed to solve; the general strategy selected for the solution of the problem; release date; level of development; a description of the product; product users; product outcomes (i.e., expected changes resulting from product use); potential educational consequences; a list of product elements; start-up costs; operating costs; and likely market. Over 1,000 product reports have been received by the American Institutes for Research, which is collecting the information for NCERD under contract.

5. The present project, the Evaluation of the Impact of Educational Research and Development Products, has identified major sources of product development. The project has further developed some inexpensive mail questionnaire procedures that can serve to obtain relevant product impact information. The actual questionnaire used in the project can be modified based upon the experience obtained in conducting the case studies and quantifying information for data analyses. By using such a questionnaire, a large percentage of product developing organizations can be inexpensively polled. This could be done on a regular basis to indicate changes in evidence of impact or other new

data on previously reported products, and to collect information on products developed since the last polling.

6. An additional source of information on impact of products in use could be developed as part of current or future national reporting systems, such as the OE National Center for Educational Statistics Consolidated Program Information Report. Data regarding the use of educational products, particularly relatively new products, could easily be included in a standard way in such reports. This would give an indication of the extent of use of products in all public schools rather than simply a sample.

RECOMMENDATIONS FOR FURTHER RESEARCH

From a study of this kind, many possibilities for further research can be suggested. Five possibilities, described below, are: an educational analogue of Project TRACE; a study of factors related to adoption by users; adaption of the Product Development Reports for other audiences; the determination of factors predictive of later product impact; and the development of a system for monitoring product development.

An Educational Analogue of Project TRACE

Project TRACE, funded by the National Science Foundation, documented the historical sequence of the key scientific events which led toward five major innovations. The purpose was to study the contributions of various types of R&D activity to innovations of importance. The study has had considerable impact. No analogue in education or the behavioral sciences exists. A systematic study of the role of research in an overall process which eventually leads to educational innovations would seem to be a highly worthwhile contribution. It could shed light on the role of the various mechanisms, institutions, funding activities, and types of research and development activity that lead to highly successful products. While there is some similarity to the current study, there are important differences. The current study focused on a number of specific products, tracing their particular development history at a relatively molecular level. It did not, as TRACE did, for example, attempt to delineate the scientific background of birth control pills, but rather the development of a particular X-company birth control pill. Nor is the current study designed to examine broadly for perhaps a 20 or 30 year preceding period those scientific and educational events leading to the development of a generic innovation. An educational Project TRACE, with certain modifications and perhaps some improvements based upon the examination of the completed TRACE project, could be of utmost importance for R&D policy.

Study of Factors Related to Adoption by Users

A second extension of the present project would be an exploration of those factors considered important in the diffusion of a product by its development/diffusion agency, and those factors considered crucial by the potential target adopters or potential users. While there is a considerable amount of literature on characteristics related to diffusion, there is much less empirical data than hypotheses. Through actual case studies, the processes by which a potential user decides to adopt or not adopt a given product can be documented. The similarities and discrepancies between the strategies of the producer/disseminator and the needs of the users could then be identified. Patterns for facilitating adoption processes could then be suggested, based on information about producer's dissemination efforts and user's adoption processes. In addition, information about users' adoption processes could be related to current Office of Education programs and policies, and recommendations prepared for consideration by Office of Education decision makers.

The need for studies of this kind has been noted by Havelock (1971). Havelock's work is essentially an interpretive study. Although a large bibliography cites empirical studies, there is a conspicuous absence of empirical observations or tests of hypotheses in Havelock's volume. Of those empirical studies identified by Havelock, over 36% were concerned with "to whom" information was sent. For example, "who uses the county extension agent." Fifteen percent of such studies were concerned with describing the "who" of the initiator or the originator of the message. In no case, in either Havelock's work or the references quoted, does there appear to be empirical comparisons between disseminator strategy and adopter perception.

In fact, this kind of study is specifically recommended by Havelock. In the introduction the following statement is made:

> We were disappointed to find so few case studies. Of the thousands of dissemination and utilization events that take place each year it is unsettling to find so few documented in such a way that others could learn from them. This deficiency in the literature was one of the factors that thwarted our efforts to code, analyze, and compare utilization processes across studies and fields. Each investigator, in effect, has his own special interest or his own special point to make, and few appear to be motivated simply to report what happened in specific utilization events (p. 1-17).

The first recommendation which Havelock derived from his overview is:

> First of all although we noted there were many quantitative research studies, there was a paucity of case materials. We need more case studies which carefully document and report dissemination and utilization events. Such events, of course, come in all shapes and sizes, but we would include here training projects, development projects, and installation of new roles, and the development of new organization forms as all being activities requiring careful case reporting and documentation (p. 11-12).

In addition, one of the ten research priorities identified by Havelock, and described as an area in which we know practically nothing, has to do with comparative evaluation of different knowledge utilization strategies. He notes that:

> . . . there is a dearth of well-documented and comparable case study material on D&U, and we have urged that there be more studies along such lines provided they can be collected, compared, and summated in some way. A related need is for the systematic documentation of specific strategies of utilization as employed by different change agents. Such studies should include data on characteristics of senders and receivers, messages, and media, a delineation of stages followed, implicit or explicit models of D&U employed, and results, assumed, observed, or measured (p. 11-36).

Thus, the research proposed above complements and implements Havelock's work, and is consonant with one of his major recommendations for future research.

Adaptation of the Present Product Development Reports for Other Audiences

Consideration should be given to possible revisions and adaptations of some of the Product Development Reports. Although the case studies emphasized key events in the development of the products, some of the products are highly popular and of considerable interest to most people. Many of the products may be appropriately viewed as "trail blazers," or indicators of general movements in education. It may not, however, be anticipated that the Product Development Reports would have diffusion among teachers, superintendents, school boards, parents, etc. The reports could, however, be adapted for this audience in order to develop a more favorable public climate toward the investment of money in research, development, dissemination, and evaluation. Information could be provided regarding the instructional development process as currently and successfully followed and the resources demanded in successful development, diffusion, and evaluation.

Determination of Factors Predictive of Later Product Impact

It appears that many instructional products, if adequately documented in the design and early developmental stages, could be evaluated for probable impact if appropriate analytical procedures were developed. This type of formative evaluation procedure could greatly increase the impact of research and development programs on education. In addition, decision makers should know the relationship between various factors in the research and development process and the expected degree of impact of educational products. Hence, a study should be undertaken to provide a more precise basis for the prediction of the impact of educational products than is currently available. Using data available from the current study and others, the logical and statistical relationships between various aspects of the development and diffusion process can be studied as they relate to factors associated with successful impact. Well-known statistical techniques such as multiple regression and factor analyses could be employed, and provisions made for cross-validation of the relationships derived in order to assure their generality to other products. Once the relationships were known, decisions regarding funding new product development, for example, could be facilitated by noting whether or not the proposals for such projects provided for the necessary elements related to later product impact.

Development of a System for Monitoring Product Development

One method for increasing the effectiveness of the research and development program in the field of education would be the development of a system for the continuing evaluation of R&D products including data on both impact and estimates of probable impact. The program would thus be under continuous audit with respect to the impact and anticipated impact of the various projects being supported in any given period. The development and implementation of such a continuous "early warning service" for product identification logically stems from both the current study and the determination of factors predictive of later product impact, as outlined above. Reviews of the Far West Laboratory ALERT System, the Information Office for the regional laboratories and R&D centers, and the work by EPIE suggest a need for both a more inclusive data source and, particularly, for a continuous stream of evaluative information.

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Table 1

Focus of the 117 Selected Products

Focus	Freq.	Percent
Subject Matter	103	88.0
Only	100	85.3
And Perceptual-Motor	2	1.7
And All Others	1	.9
Organizational Efficiency	3	2.6
Only	0	0.0
And Classroom Climate	1	.9
And Classroom Climate and Learning Procedures	1	.9
And All Others	1	.9
Classroom Climate or Operation	7	6.0
Only	0	0.0
And Organizational Efficiency	1	.9
And Organizational Efficiency and Learning Procedures	1	.9
And Learning Procedures	4	3.4
And All Others	1	.9
Learning Procedures or Methodology	12	10.3
Only	4	3.4
And Organizational Efficiency and Classroom Climate	1	.9
And Classroom Climate	4	3.4
And Perceptual-Motor	2	1.7
And All Others	1	.9
Perceptual-Motor Skills	7	6.0
Only	2	1.7
And Subject Matter	2	1.7
And Learning Procedures	2	1.7
And All Others	1	.9

Note.--Percents do not add to 100 nor frequencies to 117 due to combinations of focus.

Table 2

Focus of the 117 Selected Products by Grade Level

		Grade												
Focus		K	1	2	3	4	5	6	7	8	9	10	11	12
Subject Matter	F	37	50	47	48	45	49	54	39	44	48	43	41	39
	%	31.6	42.7	40.1	41.0	38.5	41.9	46.2	33.3	37.6	41.0	36.8	35.0	33.3
Organizational Efficiency	F	2	3	3	3	3	3	3	3	3	2	2	2	2
	%	1.7	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	1.7	1.7	1.7	1.7
Classroom Climate-Operation	F	5	6	7	7	4	4	4	4	4	3	3	3	3
	%	4.3	5.1	6.0	6.0	3.4	3.4	3.4	3.4	3.4	2.6	2.6	2.6	2.6
Learning Procedures-Methodology	F	8	9	10	9	6	6	6	5	5	5	5	5	5
	%	6.8	7.7	8.5	7.7	5.1	5.1	5.1	4.3	4.3	4.3	4.3	4.3	4.3
Perceptual Motor Skills	F	5	4	4	3	2	2	2	2	2	2	2	2	2
	%	4.3	3.4	3.4	2.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7

Note.--Percents do not add to 100 nor frequencies to 117 due to combinations of focus and grade level.

Table 3

Subject Matter Content of the 117 Selected Products

Subject Matter Content	Freq.	Percent
Language	41	35.0
Only	22	18.8
And Mathematics	3	2.6
And Social Studies	2	1.7
And Mathematics, Science, and Social Studies	10	8.5
And All Others	4	3.4
Mathematics	30	25.6
Only	9	7.7
And Language	3	2.6
And Language, Science, and Social Studies	10	8.5
And Science	2	1.7
And Science and Social Studies	2	1.7
And All Others	4	3.4
Science	45	38.5
Only	25	21.4
And Language, Mathematics, and Social Studies	10	8.5
And Mathematics	2	1.7
And Mathematics and Social Studies	2	1.7
And Social Studies	2	1.7
And All Others	4	3.4
Social Studies	49	41.9
Only	29	24.8
And Language	2	1.7
And Language, Mathematics, and Science	10	8.5
And Mathematics and Science	2	1.7
And Science	2	1.7
And All Others	4	3.4
Vocational Education	11	9.4
Only	7	6.0
And All Others	4	3.4

Note.--Percents do not add to 100 nor frequencies to 117 due to combinations of content.

Table 4

Content of the 117 Selected Products by Grade Level

Content		Grade												
		K	1	2	3	4	5	6	7	8	9	10	11	12
Language	F	24	30	25	26	19	19	18	14	14	11	10	9	10
	%	20.5	25.6	21.4	22.2	16.2	16.2	15.4	12.0	12.0	9.4	8.5	7.7	8.5
Mathematics	F	19	23	22	20	15	15	15	10	11	13	12	12	12
	%	16.2	19.7	18.8	[illegible]	12.8	12.8	12.8	8.5	9.4	11.1	10.2	10.2	10.2
Science	F	21	21	21	20	16	18	20	16	20	23	21	16	16
	%	17.9	17.9	17.9	17.1	13.7	15.4	17.1	13.7	17.1	19.7	17.9	13.7	13.7
Social Studies	F	29	30	32	31	27	26	31	24	24	27	26	25	24
	%	24.5	25.6	27.4	26.5	23.1	22.2	26.5	20.5	20.5	23.1	22.2	21.4	20.5
Vocational Education	F	2	4	3	3	3	3	3	4	5	8	7	9	9
	%	1.7	3.4	2.6	2.6	2.6	2.6	2.6	3.4	4.3	6.8	6.0	7.7	7.7

Note.--Percents do not add to 100 nor frequencies to 117 due to combinations of content and grade level.

Table 5

Format of the 117 Selected Products

Format	Freq.	Percent
Paper Products	99	84.6
Only	30	25.6
And Audio-Visual	19	16.2
And Audio-Visual and Kits	24	20.5
And Audio-Visual, Kits, and Computer	1	.9
And Kit	19	16.2
And Computer	6	5.1
By Paper Product:		
Textbooks Only	10	8.5
Textbooks and Other Format(s)	65	55.6
Workbooks Only	0	0.0
Workbooks and Other Format(s)	24	20.5
Manuals or Guides Only	8	6.8
Manuals and Other Format(s)	68	58.1
Tests Only	0	0.0
Tests and Other Format(s)	22	18.8
Audio-Visual	47	40.2
Only	1	.9
And Paper Products	19	16.2
And Paper Products and Kits	24	20.5
And Paper Products, Kits, and Computer	1	.9
And Kit	1	.9
And Computer	1	.9
By Audio-Visual:		
Television Only	0	0.0
Television and Other Format(s)	2	1.7
Films (slides, strips, movie) Only	0	0.0
Films and Other Format(s)	40	34.2
Audio Equipment (records, tapes) Only	1	.9
Audio Equipment and Other Format(s)	31	26.5
Kits and Equipment	47	40.2
Only	2	1.7
And Paper Products	19	16.2
And Paper Products and Audio-Visual	24	20.5
And Paper Products, Audio-Visual, and Computer	1	.9
And Audio-Visual	1	.9

(Table continued on next page)

Table 5 (Continued)

Format of the 117 Selected Products

Format	Freq.	Percent
Kits and Equipment (Continued)		
By Kits and Equipment:		
Kits Only	0	0.0
Kits and Other Format(s)	19	16.2
Displays (charts, maps, models) Only	0	0.0
Displays and Other Format(s)	15	12.8
Games Only	1	.9
Games and Other Format(s)	19	16.2
Laboratory Equipment Only	0	0.0
Laboratory Equipment and Other Format(s)	15	12.8
Computer	10	8.5
Only	2	1.7
And Paper Products	6	5.1
And Paper Products, Audio-Visual, and Kits	1	.9
And Audio-Visual	1	.9
Don't Know	11	9.4

Note.--Percents do not add to 100 nor frequencies to 117 due to combinations of format.

Table 6

Grade Level of the 117 Selected Products

Grade	Freq.	Percent
K	50	42.7
1	60	51.2
2	60	51.2
3	57	48.7
4	53	45.2
5	55	47.0
6	58	49.5
7	44	37.6
8	50	42.7
9	55	47.0
10	49	41.8
11	46	39.3
12	44	37.6

Note.--Percents do not add to 100 nor frequencies to 117 since a product usually spans a number of grades.

Table 7

Grades Covered by the 117 Selected Products

Number of Grades Covered*	Freq.	Percent
1	10	8.5
2-3	30	25.6
4-6	35	29.9
7-9	21	17.9
10-13	21	17.9

*Refers to total number of grades, not levels

Table 8

Intended Percent of Target Population for the 117 Selected Products

Target Population*	Freq.	Percent
25%	9	7.7
50%	10	8.5
75%	18	15.4
100%	80	68.4

*Percent heading refers to percentage of that school population.

Table 9

Number of Schools in Which the 117 Selected Products Are in Use

Number of Schools	Freq.	Percent
5-100	58	49.5
101-500	34	29.0
501-1,000	10	8.6
1,001-5,000	10	8.6
5,001-35,000	5	4.3

Table 10

Number of Students Using the 117 Selected Products

Number of Students	Freq.	Percent
100-1,000	12	10.3
1,001-5,000	20	17.1
5,001-10,000	25	21.3
10,001-50,000	29	24.8
50,001-100,000	12	10.3
More than 100,000	19	16.2

Table 11

Year the 117 Selected Products Came Into Use

Year Came Into Use	Freq.	Percent
1965	7	6.0
1966	11	9.4
1967	22	18.8
1968	27	23.1
1969	21	17.9
1970	29	24.8

Table 12

Focus of the 117 Selected Products by Type of Developer

Focus		Type of Developer Government	 Profit-Making	 Private Non-Profit
Subject Matter	F	48	27	28
	%	41.0	23.1	23.9
Organizational Efficiency	F	0	0	3
	%	0	0	2.6
Classroom Climate-Operation	F	3	0	4
	%	2.6	0	3.4
Learning Procedures-Methodology	F	6	3	3
	%	5.1	2.6	2.6
Perceptual-Motor Skills	F	3	3	1
	%	2.6	2.6	.9

Note.--Percents do not add to 100 nor frequencies to 117 due to combinations of focus.

Table 13

Content of the 117 Selected Products by Type of Developer

Content		Type of Developer Government	 Profit-Making	 Private Non-Profit
Language	F	15	17	9
	%	12.8	14.5	7.7
Mathematics	F	13	7	10
	%	11.1	6.0	8.5
Science	F	21	9	15
	%	17.9	7.7	12.8
Social Studies	F	22	10	17
	%	18.8	8.5	14.5
Vocational Education	F	7	1	3
	%	6.0	.9	2.6

Note.--Percents do not add to 100 nor frequencies to 117 due to combinations of content.

Table 14

Locations of the Developers of the 117 Selected Products

Location of Developers	Frequency	Percent
West	35	29.9
North Central	10	8.5
South Central	1	.9
Northeast	63	53.8
Southeast	8	6.8

Table 15

Locations of the Developers of the 117 Selected Products
By Type of Developer

Location of Developer		Type of Developer		
		Government	Profit-Making	Private Non-Profit
West	F	22	7	6
	%	18.8	6.0	5.1
North Central	F	8	1	1
	%	6.8	.9	.9
South Central	F	1	0	0
	%	.9	0	0
Northeast	F	19	21	23
	%	16.2	17.9	19.7
Southeast	F	5	2	1
	%	4.3	1.7	.9

Table 16

Distribution of 21 Exemplary Products Across
Additional Selection Criteria and Constraints

Focus[a]

Lang.	Math	Science	Soc. Studies	Voc. Ed.	Facilitating Factors
9	7	7	8	3	4

Format

The products were selected so as to represent: comprehensive formats with all the types of media; limited formats with only a textbook or manual and guide; kits; games; computer; television.

Grade Level

K-3	K-6	7-12	K-12
6	7	3	5

Extent of Use

High	Moderate	Low
17	3	1

Gain

High	Moderate	Low
11	8	2

Visibility

High	Moderate	Low
5	16	0

Developer

Government Agency	Private Non-Profit Organization	Profit-Making Organization
9	7	5

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[a] Frequencies total to more than 21 since some products have multiple foci. Data shown are not necessarily consistent with subsequent tables since product selection was based upon information from nominators as shown in Appendix E.

Table 17

Type of Developers of the 21 Exemplary Products

Type of Developers	Freq.	Percent
Regional Laboratory	3	14.3
Alone	2	9.5
With R&D Center	1	4.8
R&D Center	1	4.8
Alone	0	0.0
With Regional Laboratory	1	4.8
University	8	38.1
Alone	4	19.0
With Other Government	2	9.5
With Private Non-Profit	1	4.8
With Profit-Making	1	4.8
Other Government	3	14.3
Alone	0	0.0
With University	2	9.5
With Private Non-Profit	1	4.8
Private Non-Profit	7	33.3
Alone	4	19.0
With University	1	4.8
With Other Government	1	4.8
With Profit-Making	1	4.8
Profit-Making	6	28.6
Alone	4	19.0
With University	1	4.8
With Private Non-Profit	1	4.8

Note.--Percents do not add to 100 nor frequencies to 21 due to combinations of developers.

Table 18

Type of Disseminator of the 21 Exemplary Products

Type of Disseminator	Freq.	Percent
Regional Laboratory	3	14.3
Alone	3	14.3
R&D Center	0	0.0
University	3	14.3
Alone	0	0.0
With Profit-Making	3	14.3
Other Government	1	4.8
Alone	1	4.8
Private Non-Profit	5	23.8
Alone	1	4.8
With Profit-Making	4	19.0
Profit-Making	15	71.4
Alone	8	38.1
With University	3	14.3
With Private Non-Profit	4	19.0
No Disseminator	1	4.8

Note.--Percents do not add to 100 nor frequencies to 21 due to combinations of disseminators.

Table 19

Focus of the 21 Exemplary Products

Focus	Freq.	Percent
Subject Matter	18	85.7
Only	11	52.4
And Learning Procedures	7	33.3
Organizational Efficiency	1	4.8
Only	1	4.8
Classroom Climate or Operation	1	4.8
Only	0	0.0
And Learning Procedures	1	4.8
Learning Procedures or Methodology	8	38.1
Only	0	0.0
And Subject Matter	7	33.3
And Classroom Climate	1	4.8
Perceptual-Motor Skills	1	4.8
Only	1	4.8

Note.--Percents do not add to 100 nor frequencies to 21 due to combinations of focus.

Table 20

Grade Level of the 21 Exemplary Products

Grade Level	Freq.	Percent
Kindergarten	12	57.1
Only	2	9.5
K-2	1	4.8
K-3	3	14.3
K-6	2	9.5
K-9	1	4.8
K-12	3	14.3
Grade 1	16	76.2
Only	0	0.0
K-2	1	4.8
K-3	3	14.3
K-6	2	9.5
K-9	1	4.8
K-12	3	14.3
1-6	2	9.5
1-8	2	9.5
1-12	2	9.5
Grade 2 (Same as Grade 1 above)		
Grade 3	15	71.4
Only	0	0.0
K-3	3	14.3
K-6	2	9.5
K-9	1	4.8
K-12	3	14.3
1-6	2	9.5
1-8	2	9.5
1-12	2	9.5
Grade 4	12	57.1
Only	0	0.0
K-6	2	9.5
K-9	1	4.8
K-12	3	14.3
1-6	2	9.5
1-8	2	9.5
1-12	2	9.5
Grade 5 (Same as Grade 4 above)		
Grade 6 (Same as Grade 4 above)		
Grade 7	9	42.9
Only	0	0.0
K-9	1	4.8
K-12	3	14.3
1-8	2	9.5
1-12	2	9.5
7-9	1	4.8
Grade 8 (Same as Grade 7 above)		
Grade 9	8	38.1
Only	0	0.0
K-9	1	4.8
K-12	3	14.3
1-12	2	9.5
7-9	1	4.8
9-12	1	4.8
Grade 10	6	28.6
Only	0	0.0
K-12	3	14.3
1-12	2	9.5
9-12	1	4.8
Grade 11	7	33.3
Only	0	0.0
K-12	3	14.3
1-12	2	9.5
9-12	1	4.8
11-12	1	4.8
Grade 12 (Same as Grade 11 above)		

Note.--Percents do not sum to 100 nor frequencies to 21 since products span a number of grades.

Table 21

Extent to Which Objectives for Student Performance Were Specified for the 21 Exemplary Products

	Freq.	Percent
Very General Objectives	0	0.0
General Objectives	3	14.3
Somewhat Specific Objectives	4	19.0
Specific Objectives	6	28.6
Very Specific Objectives	8	38.1

Table 22

Format of the 21 Exemplary Products as Used in the Schools

Format	Freq.	Percent
Paper Products	21	100.0
Only	3	14.3
And Audio-Visual	2	9.5
And Audio-Visual and Kits	7	33.3
And Audio-Visual and Computer	1	4.8
And Audio-Visual, Kits, and Computer	1	4.8
And Kits	6	28.6
And Kits and Computer	1	4.8
By Paper Product:		
Textbooks Only	0	0.0
Textbooks and Other Format(s)	8	38.1
Workbooks Only	0	0.0
Workbooks and Other Format(s)	15	71.4
Manuals or Guides Only	2	9.5
Manuals and Other Format(s)	19	90.5
Tests Only	0	0.0
Tests and Other Format(s)	15	71.4
Audio-Visual	11	52.4
Only	0	0.0
And Paper Products	2	9.5
And Paper Products and Kits	7	33.3
And Paper Products and Computer	1	4.8
And Paper Products, Kits, and Computer	1	4.8
By Audio-Visual:		
Television Only	0	0.0
Television and Other Format(s)	1	4.8
Films (slides, strips, movie) Only	0	0.0
Films and Other Format(s)	8	38.1
Audio Equipment (records, tapes) Only	0	0.0
Audio Equipment and Other Format(s)	10	47.6
Kits	15	71.4
Only	0	0.0
And Paper Products	6	28.6
And Paper Products and Audio-Visual	7	33.3
And Paper Products, Audio-Visual, and Computer	1	4.8
And Paper Products and Computer	1	4.8

(Table continued on next page)

Table 22 (Continued)

Format of the 21 Exemplary Products as Used in the Schools

Format	Freq.	Percent
Kits (Continued)		
By Kits:		
Displays (charts, maps, models) Only	0	0.0
Displays and Other Format(s)	12	57.1
Games Only	0	0.0
Games and Other Format(s)	7	33.3
Laboratory Equipment Only	0	0.0
Laboratory Equipment and Other Format(s)	5	23.8
Computer	3	14.3
Only	0	0.0
And Paper Products and Audio-Visual	1	4.8
And Paper Products, Audio-Visual, and Kits	1	4.8
And Paper Products and Kits	1	4.8

Note.--Percents do not add to 100 nor frequencies to 21 due to combinations of format.

Table 23

Format of the 21 Exemplary Products as Used in Training Personnel

Format	Freq.	Percent
Paper Products	20	95.2
Only	8	38.1
And Audio-Visual	7	33.3
And Audio-Visual and Kits	4	19.0
And Audio-Visual, Kits, and Computer	1	4.8
By Paper Product:		
Textbooks Only	0	0.0
Textbooks and Other Format(s)	3	14.3
Workbooks Only	0	0.0
Workbooks and Other Format(s)	8	38.1
Manuals or Guides Only	7	33.3
Manuals and Other Format(s)	18	85.7
Tests Only	0	0.0
Tests and Other Format(s)	6	28.6
Audio-Visual	12	57.1
Only	0	0.0
And Paper Products	7	33.3
And Paper Products and Kits	4	19.0
And Paper Products, Kits, and Computer	1	4.8
By Audio-Visual:		
Television Only	0	0.0
Television and Other Format(s)	1	4.8
Films (slides, strips, movie) Only	0	0.0
Films and Other Format(s)	11	52.4
Audio-Equipment (records, tapes) Only	0	0.0
Audio Equipment and Other Format(s)	7	33.3
Kits	5	23.8
Only	0	0.0
And Paper Products and Audio-Visual	4	19.0
And Paper Products, Audio-Visual, and Computer	1	4.8
By Kits:		
Displays (charts, maps, models) Only	0	0.0
Displays and Other Format(s)	3	14.3
Games Only	0	0.0
Games and Other Format(s)	2	9.5
Laboratory Equipment Only	0	0.0
Laboratory Equipment and Other Format(s)	1	4.8

(Table continued on next page)

Table 23 (Continued)

Format of the 21 Exemplary Products as Used in Training Personnel

Computer	1	4.8
Only	0	0.0
And Paper Products, Audio-Visual, and Kits	1	4.8
No Materials	1	4.8

Note.--Percents do not add to 100 nor frequencies to 21 due to combinations of format.

Table 24

Subject Matter Content of the 21 Exemplary Products

Subject Matter Content	Freq.	Percent
Language	8	38.1
Only	4	19.0
And Mathematics	2	9.5
And Mathematics, Science, & Social Studies	2	9.5
Mathematics	6	28.6
Only	2	9.5
And Language	2	9.5
And Language, Science, & Social Studies	2	9.5
Science	5	23.8
Only	3	14.3
And Language, Mathematics, & Social Studies	2	9.5
Social Studies	7	33.3
Only	4	19.0
And Language, Mathematics, & Science	2	9.5
And Vocational Education	1	4.8
Vocational Education	2	9.5
Only	1	4.8
And Social Studies	1	4.8
No Subject Matter Content	2	9.5

Note.--Percents do not add to 100 nor frequencies to 21 due to combinations of subject matter content.

Table 25

Cost of the 21 Exemplary Products to Users

Cost/Student/Year	Freq.	Percent
$1	3	14.3
$3	2	9.5
$4	2	9.5
$5	3	14.3
$8	2	9.5
$20	1	4.8
$30	1	4.8
$40	1	4.8
$100	1	4.8
$200	1	4.8
No Information	4	19.0

Table 26

Period of Student Use of the 21 Exemplary Products

Period of Student Use	Freq.	Percent
Continuous Use (Hours Per Semester)		
20-29	2	9.5
30-39	3	14.3
40-49	3	14.3
80-89	1	4.8
90-99	3	14.3
120-129	1	4.8
130-139	1	4.8
180-189	1	4.8
Over 400	1	4.8
Non-Continuous (Total Hours)		
1-9	1	4.8
10-19	1	4.8
Not Applicable	3	14.3

Table 27

Number of Key Development Staff for the 21 Exemplary Products

Number of Key Staff	Freq.	Percent
1	1	4.8
2	2	9.5
3	3	14.3
4	3	14.3
5	2	9.5
6	5	23.8
7	1	4.8
8	1	4.8
12	2	9.5
16	1	4.8

Table 28

Number of Key Development Staff for the
21 Exemplary Products with Doctorates

Number of Key Staff with Doctorates	Freq.	Percent
0	2	9.5
1	3	14.3
2	5	23.8
3	3	14.3
4	2	9.5
5	1	4.8
6	2	9.5
7	1	4.8
12	2	9.5

Table 29

Composition of Key Developmental Staff
for the 21 Exemplary Products

Type of Staff	Freq.	Percent
Teachers	2	9.5
Only	0	0.0
And Faculty Members	1	4.8
And Administrators and R&D Personnel	1	4.8
College Faculty Members	12	57.1
Only	2	9.5
And Teachers	1	4.8
And Administrators	3	14.3
And R&D Personnel	3	14.3
And Administrators and R&D Personnel	3	14.3
Administrators	11	52.4
Only	0	0.0
And Teachers and R&D Personnel	1	4.8
And Faculty Members	3	14.3
And Faculty Members and R&D Personnel	3	14.3
And R&D Personnel	4	19.0
R&D Personnel	15	71.4
Only	4	19.0
And Teachers and Administrators	1	4.8
And Faculty Members	3	14.3
And Faculty Members and Administrators	3	14.3
And Administrators	4	19.0

Note.--Percents do not add to 100 nor frequencies to 21 due to combinations of type of staff.

Table 30

How User Needs Were Determined Prior to the Development of the 21 Exemplary Products

How Needs Were Determined	Freq.	Percent
Educated Guess Based on Past Experiences	21	100.0
Only	2	9.5
And Asked Knowledgeable People	9	42.9
And Observation	1	4.8
And Asked and Observation	4	19.0
And Asked and Performance Measures	1	4.8
And All Others	4	19.0
Asked Knowledgeable People or Reviewed Literature	18	85.7
Only	0	0.0
And Educated Guess	9	42.9
And Educated Guess and Observation	4	19.0
And Educated Guess and Performance Measures	1	4.8
And All Others	4	19.0
Observation of User Sample	9	42.9
Only	0	0.0
And Educated Guess	1	4.8
And Educated Guess and Asked	4	19.0
And All Others	4	19.0
Performance Measures	5	23.8
Only	0	0.0
And Educated Guess and Asked	1	4.8
And All Others	4	19.0

Note.--Percents do not add to 100 nor frequencies to 21 due to combinations of how needs were determined.

Table 31

Total Cost to Get the 21 Exemplary Products From Origin to User

Dollars in Thousands	Freq.	Percent
50	1	4.8
90	1	4.8
280	1	4.8
360	1	4.8
480	1	4.8
1,000	2	9.5
1,500	1	4.8
2,000	1	4.8
2,250	1	4.8
3,000	2	9.5
4,000	2	9.5
5,000	2	9.5
9,000	1	4.8
14,000	1	4.8
No Information	3	14.3

Table 32

Procedures Used for First Cycle of Formative Evaluation of the 21 Exemplary Products

Procedure Used	Freq.	Percent
Development Staff Taught Using Product	9	42.9
Only	1	4.8
And Asked Teacher and Staff Observed	1	4.8
And Staff Observed and Performance Measures	1	4.8
And All Others	6	28.6
Asked Classroom Teacher	17	81.0
Only	0	0.0
And Staff Taught and Staff Observed	1	4.8
And Staff Observed	4	19.0
And Staff Observed and Performance Measures	5	23.8
And Performance Measures	1	4.8
And All Others	6	28.6
Development Staff Observed in Use	19	90.5
Only	1	4.8
And Staff Taught and Asked Teacher	1	4.8
And Staff Taught and Performance Measures	1	4.8
And Asked Teacher	4	19.0
And Asked Teacher and Performance Measures	5	23.8
And Performance Measures	1	4.8
And All Others	6	28.6
Obtained Performance Measures	14	66.7
Only	0	0.0
And Staff Taught and Staff Observed	1	4.8
And Asked Teacher	1	4.8
And Asked Teacher and Staff Observed	5	23.8
And Staff Observed	1	4.8
And All Others	6	28.6

Note.--Percents do not add to 100 nor frequencies to 21 due to combinations of procedures.

Table 33

Procedures Used for Second Cycle of Formative Evaluation of the 21 Exemplary Products

Procedure Used	Freq.	Percent of	
		21 Products	Products With 2nd Cycle
No Second Cycle	6	28.6	--
Development Staff Taught Using Product	5	23.8	33.3
Only	0	0.0	0.0
And Asked Teacher and Staff Observed	1	4.8	6.7
And All Others	4	19.0	26.7
Asked Classroom Teacher	15	71.4	100.0
Only	0	0.0	0.0
And Staff Taught and Staff Observed	1	4.8	6.7
And Staff Observed	3	14.3	20.0
And Staff Observed and Performance Measures	6	28.6	40.0
And Performance Measures	1	4.8	6.7
And All Others	4	19.0	26.7
Development Staff Observed in Use	14	66.7	93.3
Only	0	0.0	0.0
And Staff Taught and Asked Teacher	1	4.8	6.7
And Asked Teacher	3	14.3	20.0
And Asked Teacher and Performance Measures	6	28.6	40.0
And All Others	4	19.0	26.7
Obtained Performance Measures	11	52.4	73.3
Only	0	0.0	0.0
And Asked Teacher	1	4.8	6.7
And Asked Teacher and Staff Observed	6	28.6	40.0
And All Others	4	19.0	26.7

Note.--Percents do not add to 100 nor frequencies to 21 due to combinations of procedures.

Table 34

Procedures Used for Third and Subsequent Cycles of Formative Evaluation of the 21 Exemplary Products

Procedures Used	Freq.	Percent of 21 Products	Percent of Products With Cycle
Third Cycle			
No Third Cycle	10	47.6	--
Development Staff Taught Using Product	3	14.3	27.3
Only	0	0.0	0.0
And Asked Teacher and Staff Observed	1	4.8	9.1
And All Others	2	9.5	18.2
Asked Classroom Teacher	11	52.4	100.0
Only	0	0.0	0.0
And Staff Taught and Staff Observed	1	4.8	9.1
And Staff Observed	2	9.5	18.2
And Staff Observed and Performance Measures	5	23.8	45.5
And Performance Measures	1	4.8	9.1
And All Others	2	9.5	18.2
Development Staff Observed in Use	10	47.6	90.9
Only	0	0.0	0.0
And Staff Taught and Asked Teacher	1	4.8	9.1
And Asked Teacher	2	9.5	18.2
And Asked Teacher and Performance Measures	5	23.8	45.5
And All Others	2	9.5	18.2
Obtained Performance Measures	8	38.1	72.7
Only	0	0.0	0.0
And Asked Teacher	1	4.8	9.1
And Asked Teacher and Staff Observed	5	23.8	45.5
And All Others	2	9.5	18.2
Subsequent Cycles			
No Subsequent Cycle	16	76.2	--
Development Staff Taught Using Product	2	9.5	40.0
Only	0	0.0	0.0
And All Others	2	9.5	40.0

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Table 34 (Continued)

Procedures Used for Third and Subsequent Cycles of Formative Evaluation of the 21 Exemplary Products

Procedures Used	Freq.	Percent of	
		21 Products	Products With Cycle
Asked Classroom Teacher	5	23.8	100.0
Only	0	0.0	0.0
And Staff Observed	1	4.8	20.0
And Staff Observed and Performance Measures	1	4.8	20.0
And Performance Measures	1	4.8	20.0
And All Others	2	9.5	40.0
Development Staff Observed in Use	4	19.0	80.0
Only	0	0.0	0.0
And Asked Teacher	1	4.8	20.0
And Asked Teacher and Performance Measures	1	4.8	20.0
And All Others	2	9.5	40.0
Obtained Performance Measures	4	19.0	80.0
Only	0	0.0	0.0
And Asked Teacher	1	4.8	20.0
And Asked Teacher and Staff Observed	1	4.8	20.0
And All Others	2	9.5	40.0

Note.--Percents do not add to 100 nor frequencies to 21 due to combinations of procedures.

Table 35

Degree to Which Formative Evaluations Data Were Used to Modify the 21 Exemplary Products

Degree of Modification	First Cycle			Second Cycle			Third Cycle			Other Cycles		
	Freq.	Percent of		Freq.	Percent of		Freq.	Percent of		Freq.	Percent of	
		21 Products	Products with Cycle		21 Products	Products with Cycle		21 Products	Products with Cycle		21 Products	Products with Cycle
Not at All	0	0.0	0.0	1	4.8	6.7	0	0.0	0.0	0	0.0	0.0
Only a Little	1	4.8	4.8	0	0.0	0.0	0	0.0	0.0	1	4.8	20.0
Some	3	14.3	14.3	3	14.3	20.0	7	33.3	63.6	1	4.8	20.0
Much	3	14.3	14.3	7	33.3	46.7	2	9.5	18.2	2	9.5	40.0
Very Much	14	66.7	66.7	4	19.0	26.7	2	9.5	18.2	1	4.8	20.0
Not Applicable	0	0.0	--	6	28.6	--	10	47.6	--	16	76.2	--

Table 36

Large and Small Scale Field Tests for Each of the 21 Exemplary Products

No. of Field Tests	Small Scale		Large Scale		All Field Tests	
	F	%	F	%	F	%
None	12	57.1	8	38.1	5	23.8
1	6	28.6	6	28.6	6	28.6
2	0	0.0	3	14.3	4	19.0
3	1	4.8	2	9.5	2	9.5
4	0	0.0	1	4.8	0	0.0
5	1	4.8	0	0.0	2	9.5
6	0	0.0	0	0.0	1	4.8
No Information	1	4.8	1	4.8	1	4.8

Note.--Data are based upon information available to the project staff as reported in the Product Development Reports.

Table 37

Funding Source for the Major Field Test of
Each of the 21 Exemplary Products

Funding Source	Freq.	Percent
Regional Laboratory	4	19.0
Alone	3	14.3
And Other Government	1	4.8
R&D Center	0	0.0
University	2	9.5
Alone	0	0.0
And Other Government	2	9.5
Other Government	10	47.6
Alone	2	9.5
And Regional Laboratory	1	4.8
And University	2	9.5
And Private Non-Profit	2	9.5
And Private Non-Profit and Profit-Making	1	4.8
And Profit-Making	2	9.5
Private Non-Profit	3	14.3
Alone	0	0.0
And Other Government	2	9.5
And Other Government and Profit-Making	1	4.8
Profit-Making	4	19.0
Alone	1	4.8
And Other Government	2	9.5
And Other Government and Private Non-Profit	1	4.8
Not Applicable (No Field Tests)	5	23.8
No Information	2	9.5

Note.--Percents do not add to 100 nor frequencies to 21 due to combinations of funding source.

Table 38

Geographical Extent of Field Tests of the 21 Exemplary Products

No. of States	Freq.	Percent
1 State	4	19.0
2 States	1	4.8
3 States	3	14.3
4 States	3	14.3
7 States	1	4.8
11 States	1	4.8
Not Applicable (no field tests)	5	23.8
No Information	3	14.3

Table 39

Reported Studies on Effectiveness of the
21 Exemplary Products by Type of Gain or Effect

Number of Studies by Type of Gain or Effect	No. of Products That Had					
	Studies Conducted During Product Development		Large Field Scale Tests		Small Field Scale Tests	
Cognitive Gains	Freq.	Percent	Freq.	Percent	Freq.	Percent
Positive Gains						
Reported in One Study	6	28.6	4	19.0	1	4.8
Reported in Two Studies	1	4.8	1	4.8	2	9.5
Reported in Three Studies	0	0.0	2	9.5	0	0.0
No Studies Available	14	66.7	14	66.7	18	85.7
Mixed Gains						
Reported in One Study	3	14.3	7	33.3	1	4.8
Reported in Two Studies	1	4.8	0	0.0	0	0.0
No Studies Available	17	81.0	14	66.7	20	95.2
Negative Gains						
Reported in One Study	0	0.0	1	4.8	4	19.0
No Studies Available	21	100.0	20	95.2	17	81.0
Affective Gains						
Positive Gains						
Reported in One Study	1	4.8	3	14.3	2	9.5
Reported in Two Studies	0	0.0	0	0.0	1	4.8
No Studies Available	20	95.2	18	85.7	18	85.7

(Table continued on next page)

Table 39 (Continued)

Reported Studies on Effectiveness of the
21 Exemplary Products by Type of Gain or Effect

Number of Studies by Type of Gain or Effect	No. of Products That Had					
	Studies Conducted During Product Development		Large Field Scale Tests		Small Field Scale Tests	
Affective Gains (Continued)	Freq.	Percent	Freq.	Percent	Freq.	Percent
Mixed Gains						
Reported in One Study	0	0.0	0	0.0	0	0.0
Reported in Two Studies	1	4.8	0	0.0	0	0.0
No Studies Available	20	95.2	21	100.0	21	100.0
Negative Gains						
No Studies Available	21	100.0	21	100.0	21	100.0
Facilitating Effects						
Positive Effects						
Reported in One Study	2	9.5	1	4.8	0	0.0
No Studies Available	19	90.5	20	95.2	21	100.0
Mixed Effects						
No Studies Available	21	100.0	21	100.0	21	100.0
Negative Effects						
No Studies Available	21	100.0	21	100.0	21	100.0

Note.--Data are based upon information available to the project staff as reported in the Product Development Reports. See text for definitions of positive, mixed, and negative.

Table 40

Effectiveness of the 21 Exemplary Products by Focus
Considering Only the Most Positive Evidence Available

Evidence of Effectiveness by Focus	No. of Products That Had						No. of Products Considering Most Positive Evidence Over All Studies[1]	
	Studies Conducted During Product Development		Large Field Scale Tests		Small Field Scale Tests			
	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent
Products With Focus on Subject Matter & Facilitating Factors (N=7)								
Positive Cognitive Gains Only	1	4.8	2	9.5	1	4.8	3	14.3
Positive Cognitive & Positive Affective Gains	1	4.8	0	0.0	0	0.0	1	4.8
Mixed Cognitive Gains Only	2	9.5	1	4.8	0	0.0	0	0.0
Mixed Cognitive & Positive Affective Gains	0	0.0	1	4.8	0	0.0	2	9.5
Negative Cognitive Gains Only	0	0.0	0	0.0	1	4.8	0	0.0
Positive Affective Gains Only	0	0.0	1	4.8	1	4.8	1	4.8
Positive Gacilitating Effects Only	0	0.0	0	0.0	0	0.0	0	0.0
No Studies Available	3	14.3	2	9.5	4	19.0	0	0.0
Products With Focus on Subject Matter Only (N=11)								
Positive Cognitive Gains Only	5	23.8	5	23.8	1	4.8	6	28.6
Positive Cognitive & Positive Affective Gains	0	0.0	0	0.0	1	4.8	2	9.5
Mixed Cognitive Gains Only	0	0.0	0	0.0	1	4.8	0	0.0
Mixed Cognitive & Positive Affective Gains	0	0.0	1	4.8	0	0.0	1	4.8
Mixed Cognitive & Mixed Affective Gains	1	4.8	0	0.0	0	0.0	1	4.8

(Table continued on next page)

Table 40 (Continued)

Effectiveness of the 21 Exemplary Products by Focus
Considering Only the Most Positive Evidence Available

Evidence of Effectiveness by Focus	No. of Products That Had						No. of Products Considering Most Positive Evidence Over All Studies[1]	
	Studies Conducted During Product Development		Large Field Scale Tests		Small Field Scale Tests			
	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent
Products With Focus on Subject Matter Only (Continued) (N=11)								
Negative Cognitive Gains Only	0	0.0	0	0.0	1	4.8	0	0.0
Positive Affective Gains Only	0	0.0	0	0.0	1	4.8	0	0.0
Positive Facilitating Effects Only	0	0.0	0	0.0	0	0.0	0	0.0
No Studies Available	5	23.8	5	23.8	6	28.6	1	4.8
Products With Focus on Facilitating Factors Only (N=3)								
Positive Facilitating Effects Only	2	9.5	1	4.8	0	0.0	3	14.3
No Studies Available	1	4.8	1	4.8	2	9.5	0	0.0
No Information	0	0.0	1	4.8	1	4.8	0	0.0

Note.--When more than one study was available for a product, only the one with the most positive evidence was used. For example, if three studies were available for a product showing positive, mixed, and negative gain respectively, the positive results only would have been considered. See text for definitions of positive, mixed, and negative.

[1] Results considering most positive evidence over all studies is not equal to the sum of other columns. For example, if for a product mixed gains were found in a large scale field test while positive gains were found in a small scale field test, the latter result only would be used.

Table 41

Extent to Which the 21 Exemplary Products Were Modified as a Result of Major Field Tests

Extent of Modification	Freq.	Percent
Not at All	1	4.8
Only a Little	7	33.3
Somewhat	4	19.0
Much	2	9.5
Very Much	0	0.0
No Field Tests	5	23.8
No Information	2	9.5

Table 42

Type of Marketer or Distributor of the 21 Exemplary Products

Type of Marketer or Distributor	Freq.	Percent
Regional Laboratory	2	9.5
Alone	1	4.8
And Profit-Making	1	4.8
R&D Center	0	0.0
University	0	0.0
Other Government	1	4.8
Alone	1	4.8
Private Non-Profit	2	9.5
Alone	0	0.0
And Profit-Making	2	9.5
Profit-Making	18	85.7
Alone	15	71.4
And Regional Laboratory	1	4.8
And Private Non-Profit	2	9.5
No Marketer or Distributor	1	4.8

Note.--Percents do not add to 100 nor frequencies to 21 due to combinations of marketers or distributors.

Table 43

Diffusion Techniques Used for the 21 Exemplary Products

	Tell		Show		Involve		Train		Intervene	
When Used	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent
Very Late	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Late	1	4.8	2	9.5	0	0.0	4	19.0	1	4.8
Midway	5	23.8	7	33.3	1	4.8	6	28.6	1	4.8
Early	9	42.9	9	42.9	7	33.3	6	28.6	1	4.8
Very Early	6	28.6	2	9.5	6	28.6	1	4.8	0	0.0
Not Used	0	0.0	1	4.8	7	33.3	4	19.0	18	85.7

Table 44

Extra Staff Requirements for Use of the 21 Exemplary Products

Extra Staff Requirements	Freq.	Percent
Supervision	4	19.0
Only	1	4.8
And Paraprofessional	1	4.8
And Consultants	1	4.8
And All Others	1	4.8
Paraprofessional	5	23.8
Only	3	14.3
And Supervision	1	4.8
And All Others	1	4.8
Additional Teachers	2	9.5
Only	1	4.8
And All Others	1	4.8
Consultants	4	19.0
Only	2	9.5
And Supervision	1	4.8
And All Others	1	4.8
None	11	52.4

Note.--Percents do not add to 100 nor frequencies to 21 due to combinations of requirements.

Table 45

Methods of Obtaining Feedback From Users of the 21 Exemplary Products

Method	Freq.	Percent
Informal Collection of Information	19	90.5
Only	15	71.4
And Systematic Sampling	3	14.3
And All Others	1	4.8
Systematic Sampling	5	23.8
Only	1	4.8
And Informal Collection	3	14.3
And All Others	1	4.8
Survey of All Users	1	4.8
Only	0	0.0
And All Others	1	4.8
None	1	4.8

Note.--Percents do not add to 100 nor frequencies to 21 due to combinations of methods.

APPENDIX A

SUMMARY OF THE STUDY'S OBJECTIVES AND APPROACH; INSTRUCTIONS FOR THE PRODUCT RATING FORM

AMERICAN INSTITUTES FOR RESEARCH

Center for Research and Evaluation
in the Applications of Technology in Education

The American Institutes for Research, with support from the U. S. Office of Education, is examining the process of development of "successful educational products." A number of products which have demonstrated a successful impact in schools will be identified. A selected set of those products identified will then be extensively reviewed. The review will focus upon the development and diffusion history of the product. A major objective of these reviews is to obtain empirical data regarding those development and dissemination processes which affect product impact.

To accomplish this, we need to identify a number of educational products that have had a productive impact. We are requesting your help in identifying some of these products. Would you nominate some "successful educational products"?

These products may be tangible, such as a text, or intangible, such as a teaching technique. They may be products that have been developed through federal funds, non-profit foundations and organizations, or through private enterprise. Their development may have involved your organization, or they may be products familiar to you but developed by others.

The concern is with products that have "made it" during the last few years and are in use in grades K through 12. Products that have a traceable history of development and show some indication of contributing, directly or indirectly, to measurable performance gains are of major interest.

Enclosed is a complete list of the criteria with explanatory notes for use in identifying products. On separate sheets, you will find rating forms for products. Use one rating form for each product identified. Identify as many products meeting the criteria as your time and familiarity with the products permit. An addressed and stamped envelope is enclosed for the return of rating forms.

We appreciate your cooperation. If you wish, we will keep you informed of the progress and accomplishments of this project. If you have any questions regarding the project or these procedures, please phone Carolyn Morrow, Dan Kratochvil, or me collect at (415) 328-3550, extension 97.

Sincerely,

Jack J. Crawford, Associate Director
Evaluations and Research Program

Enclosures

A•I•R ◇ CREATE ☐ P.O. BOX 1113, PALO ALTO, CALIFORNIA 94302 (LOCATION: 1791 ARASTRADERO ROAD) ☐ TEL. (415) 328-3550

INSTRUCTIONS FOR THE PRODUCT RATING FORM:

CRITERIA FOR SELECTING EDUCATIONAL PRODUCTS WITH "IMPACT"

Read the following criteria and their explanatory notes, and then use them as a guide in completing the product rating forms. The criteria are in italics.

I. Definitional Criteria

Definitional criteria are those which will be applied initially to distinguish educational products from non-products for the purpose of study delimitation. These criteria will insure that products are construed as having behavioral as well as physical attributes and as having evolved from empirical research and developmental procedures. While this is an OE supported project, proprietary products as well as products of OE supported projects should be considered. A product may be either tangible or intangible; that is, it may be a physical entity or it may be a dynamic process having clearly delineated components consistent across settings.

A.1. *The product should have explicit and well-defined goals and objectives. Or,*

2. *The product should have implicit objectives of major importance.*

Written formulation of goals and/or objectives may appear as statements of purpose or outcome. Goals should relate clearly to some broad conceptual scheme (such as curriculum) or a methodology (such as a teaching-learning technique). Objectives should indicate the target audience, conditions, and anticipated indicators of success.

B.1. *The product should have procedures and guidelines for its implementation and use. And,*

2. *The product should specify the texts, equipment, or techniques which are to be employed.*

The product may be a discrete "unit" or it may be a complex of things that are seen as integral and coherent.

C.1. *Systematic data regarding the development and use of the product in the field should be available.*

It should be possible to obtain some type of existing systematic data regarding the product's development and use in the field so that the achievement of goals or objectives could be assessed. A high degree of behavioral specificity would be desirable.

II. Impact Criteria

Impact criteria are those which will be applied to determine the importance of the product as a contribution to educational practice. This importance will be demonstrated along two dimensions: the scope or magnitude, and the effect or intensity of intended outcomes. These criteria will insure that comprehensive products having impact on a large scale, over time, will be included and that these products will have demonstrable results on the target audience.

A. Scope

1.a. *The product must be implemented in one of the following grades:*

K-1-2-3-4-5-6-7-8-9-10-11-12

b. *The product must be implemented in one of the following areas:*

Language, mathematics, social studies, sciences, or vocational education

The product must be implemented at some point within the range of grades and subject matter areas specified above. The product cannot be college level, conducted in private or by correspondence, or preschool when not in association with the school program. Either it involves content in one of the mentioned disciplines or it is a process applicable to these disciplines.

2. *The product must have presently available a full and complete written description in sufficiently definitive form that it can be installed as described.*

A "full and complete description" would include information of the type categorized under the heading Definitional Criteria.

3. *The product should be in use in at least five schools having no direct connection with the original developers.*

The intent of this criteria is to exclude those products that work due primarily to the efforts of one person.

4. *The target population at which the product is aimed should be a substantial one.*

"Substantial" should be defined as at least a fourth of the total population in U. S. schools at the intended age or grade level.

5. *The product should have been brought to the attention of the educational profession through professional journals, publications, conventions, or other broad dissemination procedures such as marketing techniques.*

Reference to the product should exist in the literature in more than one journal at a minimum, and its existence should be "known" by some reasonable proportion of professionals working in the discipline.

6. *The product should have come into use in the schools* *during the last five years.*

   A product could be "emerging" at the present time or could have been in existence at any time during the last five years.

B. Effects (The product should meet at least one of the following two conditions.)

   1. *The product should have produced results which suggest a measurable gain toward accepted educational goals relative to a specified baseline, and these results should be sustained over time.*

      Measurable gain should be indicated by the results of a controlled experiment in which the norm or starting point for the target audience was given and in which comparative data over time was obtained.

   2. *If the product impact is not directly measurable in terms of educational goals, the product should have contributed toward accepted educational goals in at least one of the following areas:*

      a. *School organizational efficiency*

      b. *Classroom climate or operation*

      c. *Learning procedures or methodology*

      d. *Improved perceptual-motor skills*

      The "areas" listed will, presumably, have a bearing on student development by modifying environment, human interactions, or skills when the product is used. "Learning procedures or methodology" includes students learning about themselves or the world of work.

APPENDIX B

PRODUCT RATING FORM

PRODUCT RATING FORM

Respondent Name ______________________________ Phone ______________

Respondent Organization ______________________________

Name of Product ______________________________

Product Developed By ______________________________

Directions. Circle the appropriate answer (Y = Yes, N = No, DK = Don't Know) or fill in the blanks.

I. Definitional Criteria

A.1. Has explicit objectives?	Y	N	DK
2. Has implicit objectives of major importance?	Y	N	DK
B.1. Has procedures and guidelines for use?	Y	N	DK
2. Specifies materials and techniques?	Y	N	DK
C.1. Data available regarding development and use?	Y	N	DK

II. Impact Criteria

A. Scope

1.a. Circle grades within which the product was implemented:

K 1 2 3 4 5 6 7 8 9 10 11 12

b. Circle areas within which the product was implemented:

Language Mathematics Science Social Studies
Vocational Education

2. Description available so product can be installed as described?	Y	N	DK

3. Estimate number of schools and number of students using the product: Schools _______ Students _______

4. Estimate the percentage of school population, at the intended grade level(s), for which the product is designed: (Circle)

5% 10% 25% 50% 75% 100%

5. Estimate amount of dissemination of the product by writing "high," "medium," or "low": __________

6. Indicate the year when the product came into classroom use: __________

B. Effects

1. Results indicate measurable gain?	Y	N	DK
2. Product contributed toward:			
School organizational efficiency?	Y	N	DK
Classroom climate or operation?	Y	N	DK
Learning procedures or methodology?	Y	N	DK
Perceptual-motor skills?	Y	N	DK

APPENDIX C

PRODUCT DESCRIPTION FORM

PRODUCT DESCRIPTION FORM

I. Product

A. Name: ____________________

B. Acronym: ____________________

II. Developer

A. Name: ____________________

B. Address (organization address if relevant): ____________________

____

C. Phone: ____________________

III. Disseminator

A. Name: ____________________

B. Address: ____________________

C. Phone: ____________________

IV. Users

A. Summary of #Schools and #Students: ____________________

____

B. Sites where operating successfully: ____________________

____

____

____

V. Descriptive Summary

A. Focus (use) of product (subject matter, organization, classroom climate or procedures, learning procedures or methodology, perceptual-motor skills). If subject matter, indicate--basic course more than 1 year, basic course 1 year, basic course less than 1 year, supplementary units or materials, organizational patterns only, manual/guides only. If not subject matter, indicate people in addition to students--parents/community group, administrators/supervisors, teachers and paraprofessionals--and school related things--room arrangement, scheduling--that are dealt with.

____

____

____

____

B. Content (language, math, science, social studies, vocational education).

____

C. Grade Level (K, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12).

____

D. Target Population (% of school population at the intended levels)

____

E. Objectives (objectives of product including short and long range goals).

____

____

____

____

____

____

F. Approach to Subject Area (e.g., non-graded, individualized, traditional, programmed instruction, computer assisted instruction, parent-community involvement, student self direction, discovery/inquiry.)

____

____

G. Format--media (textbooks--teacher, student; workbooks--lab, supplementary, worksheets; manuals/guides; television series; films--movies, filmstrips, filmloops, slides; audio equipment--records, tapes, cassettes; displays--charts, graphs, models, maps, globes, atlas, flash cards; kits; tests; games; lab equipment; computer and related equipment).

____

____

____

____

____

____

H. Number of instructional hours and recommended period of use: ____________

____

____

I. Staff training requirements:

VI. Summary of Procedures and Guidelines:

VII. Summary of Development and Diffusion Schedule:

VIII. Measured Cognitive Effects (subjects, behaviors/outcomes measured, measures employed, control groups, immediate results, sustained gains, who did research and when):

IX. Measured Affective Effects (subjects, behaviors/outcomes measured, measures employed, control groups, immediate results, sustained gains, who did research and when):

X. *Contribution Toward Accepted Educational Goals* through: organizational efficiency, classroom climate and operation, learning procedures and methodology, perceptual-motor skills. (Subjects, behaviors/outcomes measured, measures employed, control groups, immediate results, sustained gains, who did research and when.)

APPENDIX D

BRIEF NARRATIVE DESCRIPTIONS OF THE 117 SELECTED PRODUCTS

America: A Modern History of the United States was developed and is distributed by D.C. Heath and Company. In use since 1970 and designed for 75% of 11th grade social studies students, the product makes use of a text, teacher's edition, records, and tests. The student is encouraged to review important historical decisions, analyze the consequences of the decisions, and come to his own conclusions regarding them.

The Amherst Project Materials, in use since 1970, were developed by Amherst College and distributed by Hampshire College. Designed for 75% of grade 9 through 12 social studies students, the materials aim at leading students to discover some of the concepts that historians use in developing their explanations of trends and events in American history. Texts, manuals, and audio-visual aids comprise the materials. In-service training workshops for teachers and administrators are sponsored by the project.

The Anthropology Curriculum Project Materials were developed by the University of Georgia and have been in use since 1965. A social studies curriculum for all students in grades K-12, the product consists of sequential units in anthropology which aid students and teachers in using anthropological concepts as a means of developing cross cultural perspectives on human behavior. Materials include texts, guides, background materials, and tests.

The Anthropology Curriculum Study Project Materials were developed by Malcolm Collier and the American Anthropological Association and have been in use since 1968. Designed for all social studies students in grades 7 through 12, materials include texts, workbooks, manuals, audio-visual aids, and displays. The purpose of the product is to help students understand anthropological concepts at the junior and senior high school levels.

A Place to Live, developed and distributed by the National Audubon Society Educational Service, came into use in 1970. Designed for all inner-city science students in grades 4 through 6, the student workbook and teacher's manual aim at giving children an understanding of ecology even though they live in an urban area. Activities include outdoor "Walks" and "try this" exercises as well as workbook exercises.

The Arithmetic Proficiency Training Program was developed by Science Research Associates and has operated since 1970. Designed for all mathematics students in grades 1 through 8, it is a computer-administered test-and-practice program designed to provide pupils with highly individualized supplementary work in arithmetic computation.

The Bank Street College of Education Model was developed by the Bank Street College of Education and has been in use since 1969. With a focus on learning procedures and methodology and on classroom climate, the model is designed for 50% of grade K-3 pupils in all subject areas. The ultimate objective is to enable each child, in his initial years of schooling, to build a positive image of himself as a learner. The teacher training program includes orientation institutes (workshop, field trips, seminars, and laboratory observations), on-site visits by the Bank Street staff, on-site seminars, workshops, and conferences. Schools using the Bank Street Model require a teacher and two aides per classroom and one administrative staff member per ten classrooms.

The Behavioral Analysis Model was developed by Don Bushell of the University of Kansas and has operated since 1968. Designed for all preschool through 3rd grade children of low-income families, the model, consisting of guidelines and training methods, focuses on learning procedures and methodology and on classroom climate. Its goal is to teach the social and academic skills needed for success in school and concentrates on the skills of reading, mathematics, spelling, and handwriting. The principles of behaviorist psychology are applied. Programmed materials are recommended but not provided.

BSCS Laboratory Blocks were developed by the Biological Sciences Curriculum Study and have been in use since 1968. Designed for 75% of grade 9 through 12 science students, the blocks provide six-week programs of concentrated investigation into a single area of biology, thus guiding the student to his own discoveries and conclusions.

The Center for Environmental Education Materials were developed by the Minnesota Environmental Sciences Foundation and have been in use since 1967. Designed for all students at all levels of science and social studies, the materials include inquiry-oriented texts, kits, and laboratory equipment designed to help students inquire about their environment. Several teacher training classes are also offered.

Chemistry: Experiments and Principles was developed by the University of California at Berkeley in 1968 as a revision of an earlier chemistry program. Designed for 25% of 11th and 12th grade science students, the materials produced form a course based upon experiments where students' observations and measurements lead to the development of unifying principles. A text, laboratory manual, teacher's guide, pamphlets, tests, and films make up the student's materials. A variety of teacher training aids have also been produced.

Cluster Concept Programs were developed by Dr. Donald Maley and Dr. Walter Mietus of the University of Maryland and have been in use since 1967. Designed for 50% of 11th and 12th grade vocational education students, the curriculum outlines and instructional plans aim at preparing youth for entry-level capability in a variety of related occupations rather than a specific occupation. Materials include manuals and tests.

The Comprehensive School Mathematics Program was developed by the Central Midwestern Regional Educational Laboratory and has operated since 1970. Designed as complete mathematics curricula for students at all levels, the program uses audio-visual aids, games, kits, and programmed texts. The curricula attempt to provide each student with a program that is sound in content, enjoyable, and appropriate to his abilities and needs.

The Computer Assisted Instruction Drill-and-Practice Program in Elementary Mathematics was developed by Stanford University and has been in use since 1967. Designed as supplementary work for all mathematics students in grades 1 through 6, the materials provide computer-assisted, self-paced instruction in the teaching of basic mathematics skills. It requires preservice instruction by the developer.

Computer Assisted Instruction: Elementary English was developed by the Instructional Systems Division of Harcourt Brace Jovanovich, Inc., and has been in use since 1969. Designed for all language students in grades 4 through 6, the program provides computer-assisted, self-paced instruction in teaching basic English skills.

Computer-Assisted Instruction in Language Arts was developed by Stanford University and has been in use since 1968. It is designed for all language students in kindergarten through grade 3 and provides supplementary drill in basic decoding skills to complement any initial reading series to improve pupils' reading skills. Eight- to twelve-minute daily sessions at the computer are recommended.

The Conceptually Oriented Program in Elementary Science was developed by New York University and has been in operation since 1969. It is designed for all science pupils in grades K-6. The manuals and workbooks that comprise the material are based on the conceptual schemes approach and are action-centered. Nearly all activities require exploration of a non-reading nature. The ultimate goal is to give pupils an understanding of the nature of matter in terms of a few basic conceptual schemes. The program is expected to form about 80% of an elementary science curriculum. In-service training for teachers is recommended for grades 3 through 6.

Coordinated Helps in Language Development was developed by the Northwest Regional Educational Laboratory and has been in use since 1970. Designed as an aid for 50% of kindergarten pupils, the material, consisting of a teacher's guide, focuses on learning procedures and methods to help teachers conduct learning activities which will increase pupils' oral language skills.

The Correlated Curriculum Project Materials, developed by the New York City Board of Education and the Ford Foundation, have been in use since 1966 and are designed for 50% of grade 9 through 12 vocational education students. The curriculum materials aim at helping the non-academic student prepare for a career by means of exploratory courses in business, health, and industry, and preparation for a careers program in junior college.

The Creative Learning Group Drug Education Program, developed by the Creative Learning Group of Cambridge, Massachusetts, has been in use since 1970. Designed for all social studies students in grades 6 through 10, the program provides students with accurate information (regarding drug use and abuse) to help them in making important personal decisions. Texts, manuals, and audio-visual aids comprise the materials. Fifteen to twenty class sessions are recommended.

Dangerous Parallel, developed by the Foreign Policy Association and distributed by Scott-Foresman Publishing Company, is a simulation (game) designed for all social studies students in grades 9 through 12. The simulation allows students to represent six fictional nations in decision-making during international crises. Its aim is to involve students in the learning process and prepare them for subsequent learning.

Demonstration and Experimentation in Computer Training and Use in Secondary Schools Materials, developed by Thomas E. Kurtz, Kiewit Computation Center of Dartmouth College, have been in use since 1968. Designed for all students in language, mathematics, science, and social studies in grades 9 through 12, the materials aim at utilizing a computer to aid students in learning a wide variety of school subjects. Computers, texts, manuals, and workbooks comprise the materials used.

The Development of Economic Education Program, developed by the Joint Council on Economic Education, has been in use since 1969 and the materials are designed for all social studies students at all levels. The texts, guides, and filmstrips that comprise the program aim at giving students a basic background in economics.

The Development of Higher Level Thinking Abilities, developed by the Northwest Regional Educational Laboratory, has been in use since 1966. With a focus on learning procedures and methodology and on classroom climate, the materials aim at all teachers of grades 2 through 12 and prepare them to use teaching strategies which increase the abilities of students to solve problems by categorizing facts, forming generalizations, and applying the generalizations to unknown situations. Teacher training materials include a manual, film, and audio-tapes.

The Discovery Approach to American History was developed by the Carnegie Education Center, Carnegie-Mellon University, and has been in use since 1968. Designed for 75% of grade 8 through 11 social studies students, the materials encourage students to develop into independent thinkers and responsible citizens by means of inquiry techniques. Materials include texts, kits, audio-visual aids, manuals, and tests.

The DISTAR System was developed by Siegfried Engelmann and Associates and is distributed by Science Research Associates, Inc. It has been in use since 1969. Designed for 50% of K-2 language and mathematics pupils, DISTAR materials are aimed particularly at helping culturally disadvantaged children improve their language and mathematics skills through the use of behavioral objectives, teacher training, material development, pupil motivation, regular instruction, attention to individual learning problems, and parental involvement.

Drug Abuse Curriculum materials, developed by the Laredo, Texas, Independent School District, has been in operation since 1970. Designed for social studies students at all levels, the instructional materials provide a drug education curriculum with a sequential grade approach in order to enable students to make informed personal decisions regarding drug use.

Drug Decision, developed by Lockheed Educational Systems and in use since 1969, is designed for all science and social studies students in grades 6 through 10. The complete drug education program, using programmed instruction, films, and a game, is designed to give students an awareness of the problems and effects of drug abuse. The curriculum requires four hours of in-service teacher training and requires one hour daily of student use for 21 days.

Drug Experience Program: Data for Decision Making, developed by Dr. David C. Lewis and distributed by CSCS, Inc. has been in use since 1970. Designed for all social studies students in grades 6 through 12, the texts, tapes, manuals, and tests provide accurate information to students to enable them to make personal decisions regarding drug use. The materials comprise a one-semester course of 35 hours.

Earth Science Curriculum Project Materials, developed by William D. Romey and the American Geological Institute, have been in use since 1968. Designed for all science students in grades 8 through 10, the materials provide an interdisciplinary treatment and investigative approach to the earth and environmental sciences in order to give students a comprehensive view of the planet earth and its environment. Materials include texts, manuals, films, and laboratory equipment.

The Economic Man Program was developed by the University of Chicago Industrial Relations Center and is distributed by Benefic Press. Designed for all social studies students in grades 6 through 8, the materials strive to teach basic economic principles through use of model situations and a simulation game. The course encompasses one semester and uses texts, manuals, and games.

The Educational Development Center Follow-Through Model, developed by Educational Development Center, has been in use since 1968. Designed for all pupils in kindergarten through grade 3, the model operates as a consulting service aimed at providing student self-direction in an "open classroom" environment. It focuses on learning procedures and methodology and on classroom climate. Staff training is required and is provided by EDC advisors.

Educational Programming of Cultural Heritage was developed by the Berkeley Unified School District and has been in use since 1966. Designed for all social studies pupils in grades K through 6, the product is a multimedia environment for learning in the form of a demonstration chamber that makes it possible to surround the pupil with a simulated environment in order to give him an understanding of man's cultural heritage. Chamber materials include slides, texts, films, records, artifacts, tapes, and displays. A portable classroom unit that can be installed locally is under development.

The Educational Research Council Science Program, developed by ERC, has been in operation since 1967 and is designed for all science students in grades K-12. A complete science program with an articulated curriculum provides for independent study, laboratory investigations, discussion groups, computer-assisted instruction, individualized pacing, audio-tutorial instruction, simulations, and games in order to improve students' science education. Teacher and student guides, tests, and resource books comprise the instructional materials.

The Elementary Science Study Materials were developed by Educational Development Center and have been in use since 1965. Designed for all science students in kindergarten through 8th grade, the program is a highly individual, experimental one in which all pupils have access to materials for open-ended rather than teacher- or text-directed investigations. Materials include texts, films, manuals, displays, and laboratory equipment to be used three hours a week for five to seven weeks.

Facilitating Inquiry in the Classroom, developed by Northwest Regional Educational Laboratory, has been in use since 1966. Not content bound, the materials are used by teachers at all levels in a wide variety of subject areas, most often in science. Focused on learning procedures and methodology, the materials are designed to prepare teachers to perform 27 behaviors which encourage pupils to inquire and become autonomous learners. All materials (leader's guide, exercises, worksheets, evaluation forms, and audio-tapes) and procedures for using them to conduct 42 hours of instruction as an in-service workshop or college course are available.

The Field Social Studies Program was developed by Dr. Richard E. Gross and Dr. John U. Michaelis and is distributed by Field Educational Publications, Inc. In use since 1970, the program is for all social studies students in grades K-12 and represents a conceptual approach to social studies through the use of texts. One hour daily use is recommended to enable pupils to develop social studies inquiry skills and concepts.

The First Year Communication Skills Program, developed by the Southwest Regional Laboratory for Educational Research and Development, has been in use since 1967. Designed for all kindergarten pupils, the program provides a set of research-based instructional materials and procedures for teacher use in developing the reading competence of young children. Materials include texts, games, displays, and manuals.

The Frostig Program for Perceptual-Motor Development, developed by Dr. Marianne Frostig and distributed by Follett Educational Corporation, has been in use since 1969. Focused on perceptual-motor skills and learning procedures and methodology for 75% of pupils in levels K-2, the program is designed to enhance the total development of young children by improving and/or developing good health, physical well-being, sensory-motor skills, self-awareness, awareness of time and space, and the ability to communicate, to interact with others, to perceive self in relation to environment, to solve problems, and to learn. Materials include audio-visual aids, guides, books, displays, and various materials for physical activities and games.

The Glen Haven Training Program, developed by Dr. Newell Kephart and distributed by Learning Pathways, Inc., has been in use since 1969. Designed for teachers of 25% of pupils in grades K-6, and focused on learning procedures and methodology and on perceptual-motor skills, the materials aim at giving appropriate professionals the training necessary to help learners to overcome their disabilities. The local program requires approximately 30 hours of training sessions for professionals using manuals and films.

The Greater Cleveland Social Science Program, developed by the Educational Research Council of America, has been in use since 1970. Designed for all social studies pupils in grades K-6, the materials encourage pupils to analyze values in human societies. Materials include texts, guides, and audio-visual aids.

Harvard Project Physics Materials were developed by Dr. F. James Rutherford and have been in use since 1969. Designed for all science students in grades 9 through 12, the materials present physics in a broad humanistic context with maximum flexibility with regard to context, emphasis, and teaching strategies in order to encourage a wider variety of students to learn the principles of physics. Materials include texts, guides, laboratory equipment, and audio-visual aids.

The Hawaii English Project Materials, developed by the Hawaii State Department of Education and the University of Hawaii, have been in use since 1970. Designed for all language students in grades K-6, the materials teach language and literature together and allow children to perform according to individual talents and temperaments. Features of the program are inquiry approaches, activity-centered learning, specific objectives, built-in evaluation, and peer teaching. Materials include texts, workbooks, audio-visual aids, displays, games, and tests.

The Heath Urban Reading Program was developed by Educreative Systems, Inc., and has been in use since 1970. Designed for 25% of language students in grades 7 through 9, the textbooks aim at improving the reading skills of intermediate students who read below their grade level.

The High School Geography Project Materials, developed by the Association of American Geographers, have been in use since 1969. Designed as a one-year course for all social studies students in grades 9 through 12, the project attempts to develop student inquiry and decision-making attitudes and abilities. Materials include texts, manuals, workbooks, audio-visual aids, and teacher-preparation kits.

The Human Relations Training Unit was developed by the Far West Laboratory for Educational Research and Development and has been in use since 1970. Designed for 75% of 9th through 12th grade students, the films, texts, and manuals attempt to reduce attitudinal and communication barriers among teenagers and adults--particularly between ethnic groups. Materials focus on learning procedures and methodology.

The Idea-Centered Laboratory Science Project Materials, developed by W. C. Van Deventer of Western Michigan University, have been in use since 1967. Designed for 50% of 7th and 8th grade science students, the program is idea-centered and activity-based, reduces required reading to a bare minimum, and is particularly directed at slow learners. The texts, tests, and self-explanatory teacher notes aim at helping students understand the scientist's point of view and the kinds of things he does.

I Know A Place was developed by Robert Tannen and CSCS, Inc., and has been in use since 1969. Designed for all social studies pupils in grade 3, the texts attempt to increase the pupil's growth by exercising some of his developing skills and asking the pupil to organize and focus his knowledge and experiences in order to become a more effective communicator of ideas. Texts and a teacher's booklet comprise the materials.

Improving Motor-Perceptual Skills, developed by the Northwest Regional Educational Laboratory, has been in use since 1970. Designed for all kindergarten pupils, the teacher's guide assists teachers in providing practice and training to help children develop motor-perceptual abilities.

Individualized Mathematics System, developed by the Regional Educational Laboratory for the Carolinas and Virginia, has been in use since 1970. Designed for all mathematics students in grades 1 through 6, the materials allow children to progress at individual rates in dictated sequences dependent on group and individual tests and on different combinations of learning materials. The texts, tests, and manipulative devices provided aim at increasing pupil learning efficiency, motivation, and self-confidence.

Individually Prescribed Instruction was developed by the Learning Research and Development Center of the University of Pittsburgh and has been in use since 1967. Designed for all mathematics pupils in grades K-6, the program uses instructional objectives and printed and audio-visual self-instructional materials. Kits and displays are also utilized.

The Inquiry Development Program in Earth Science, developed by J. Richard Suchman and distributed by Science Research Associates, Inc., has been in use since 1968. Designed for 50% of 8th through 10th grade science students, the materials, including texts, manuals, kits, films, and workbooks, aim at stimulating students' self-directed theorizing and experimenting.

The Inquiry Development Program in Physical Science, developed by J. Richard Suchman and distributed by Science Research Associates, Inc., has been in use since 1966. Designed for all science students in grades 6 through 8, the texts, manuals, kits, films, and workbooks aim at stimulating students' self-directed theorizing and experimenting.

The Inquiry Role Approach Materials were developed by the Mid-Continent Regional Educational Laboratory and have been in use since 1968. Designed for 75% of 10th grade science students, the program organizes classes into teams of four in order to increase student participation, involvement, responsibility, and level of inquiry. It utilizes Biological Sciences Curriculum Study materials as well as manuals and audio-visual aids.

The Instructional Concepts Program, developed by Southwest Regional Laboratory for Educational Research and Development, has been in use since

1970. Designed for all kindergarten pupils, the program focuses on the language subject area, teaching pupils concepts of reading readiness. Materials include guides, charts, and pupil booklets.

Intergroup Relations Curriculum Materials, developed by the Lincoln Filene Center for Citizenship and Public Affairs of Tufts University, has been in operation since 1970. Designed for all social studies pupils in grades 1 through 6, the materials aim at developing student self-awareness and understanding of others. Texts, photographs, films, and manuals are used in the complete one-year program.

Intermediate Science Curriculum Study Materials were developed by Florida State University and have been in use since 1970. Designed for all science students in grades 7 through 9, the program permits the pace and level of instruction to be adapted to the ability and interest of each student. Materials include laboratory kits, guides, manuals, behavioral objectives, and evaluation materials.

The Interrelated Mathematics Science Project Materials, developed by Nova Schools, Secondary Division, Ft. Lauderdale, Florida, have been in use since 1969. Designed for all mathematics and science students in grades 9 through 12, the individualized program of instruction strives to teach mathematics and science interrelatedly using learning activity packages.

Introductory Physical Science, developed by Educational Development Center, has been in use since 1966. Designed for all science students in grades 8 and 9, the program strives to offer students insight into the means by which scientific knowledge is acquired, as well as to offer students an elementary knowledge of physical science. Materials include a text, teacher's guide, laboratory equipment, tests, and films.

The Language Master, developed by Bell and Howell, has been in use since 1965. Designed for use by all students, particularly in language and mathematics, the machine teaches pupils new vocabulary by allowing them to simultaneously see and hear new words or terms and to proceed at an individual pace.

The Learning Booth, developed by Far West Laboratory for Educational Research and Development, has been in use since 1969. Designed for all language pupils in kindergarten and 1st grade, the program requires children to participate only when they wish to do so. A booth attendant responds to the child's needs and desires rather than requesting the child to perform. The booth consists of a special electric typewriter and related materials. The purposes of the booth are to increase the pupil's ability to solve problems, increase his language development, improve the use of his senses and perceptions, and develop his conceptual abilities.

The Learning Mastery System was developed by the Southwest Regional Laboratory for Educational Research and Development and has been in use since 1967. The program is designed to help all 1st grade language pupils using Harper and Row and Macmillan Bank Street reading programs to use those programs efficiently in learning to read. Teacher's manuals comprise the materials.

The Listening-Reading Program was developed by Educreative Systems, Inc., and has been in use since 1970. Designed for all language pupils in grades 1 through 3, this supplementary reading program uses records and story pamphlets to develop the pupil's listening and reading skills. Pupils are motivated to read by being presented the first half of a story on record, and then they must read the second half.

LLL (Listen Look Learn)was developed by Educational Developmental Laboratories, Inc., and has been in use since 1966. Designed for 75% of all language students in grades K through 5, this program is ungraded and individual in its approach to teaching basic listening, reading, and speaking skills. Materials include texts, films, tapes, and workbooks.

Man: A Course of Study, developed by Education Development Center, has been in use since 1970. Designed for all social studies pupils in grades 5 through 7, the nine-month course developes inquiry-based, interdisciplinary curricula which focus on the unifying questions of man's experiences. Materials include manuals, guides, games, films, slides, journals, poetry, and songs.

Man in Action, developed by the Brentwood Public Schools and distributed by Prentice-Hall, Inc., has been in use since 1968. Designed for all social studies pupils in grades K-6, the program is organized around key social science concepts and presented in a way that actively involves students in the learning process. Materials include student texts and teacher manuals. The course strives to teach children the key ideas of the social sciences so that they will be able to function more effectively in school and as adults.

The Man Made World, developed by Polytechnic Institute of Brooklyn, has been in use since 1969. Designed for 75% of 10th through 12th grade mathematics, science, and social studies students, the text is directed toward students who will attend college but do not plan to study science or engineering. It is expected to "help students learn to live with and manage technological literacy and environmental quality."

The Materials and Activities for Teachers and Children Program, developed by the staff of Children's Museum in Boston, has been in use since 1965. Designed for all social studies pupils in grades K-6, the program strives to assist the pupil in developing a conceptual framework for better understanding of various aspects of life; e.g., city life. The materials, including films, pictures, games, and recordings, are highly motivational and involve meaningful non-verbal tasks for the pupil.

Mathematics: Modern Concepts and Skills, developed by D.C. Heath & Co., have been in use since 1969. Designed for 25% of 7th through 9th grade mathematics students, materials are aimed at teaching slow learners basic mathematic skills and applications of mathematics in daily life, as well as introducing basic concepts of geometry, number theory, and algebra. Three texts, teacher's editions, workbooks, tests, and audio-visual aids comprise the materials used.

The Merrill Linguistic Reading Program, developed by Charles C. Fries of the Charles E. Merrill Publishing Company, has been in use since 1966. Designed for all language pupils in grades 1 through 3, the program utilizes a linguistic approach and represents complete beginning reading instruction. Reading texts comprise the program materials.

The Michigan Social Science Education Project Materials were developed by the University of Michigan and have been in use since 1968. Designed for all social studies pupils in grades 4 through 6, the program strives to help children use social science methodology in scientific inquiry to examine problems of behavior, using themselves and the classroom as a laboratory. Materials, including texts, records, and guides, make up seven units, each requiring six to eight weeks' study.

Mike's World--Your World, developed by Hill Development Corporation and Wesleyan University and distributed by Education Ventures, Inc., has been in use since 1969. Designed for all science pupils in grades 5 and 6, the program includes readings, simulation games, and field work aimed at giving pupils information and promoting their commitment in the area of environmental conservation. The program is a supplement to the regular science curriculum.

The Minnesota Mathematics and Science Teaching Project Materials were developed by the University of Minnesota and have been in use since 1966. Designed for all mathematics and science pupils in grades K-3, the program represents coordinated teaching of mathematics and science through a four-year "spiral" curriculum using a discovery approach with manipulative materials. Materials include texts, films, games, and laboratory equipment.

Movigenic Orientation, developed by Ray Barsch, has been in use since 1967. Designed for all students at all grade levels, the program focuses on perceptual-motor improvement in order to make students better integrated learners. Texts comprise the materials used.

The Multiunit Elementary School Model, developed by the Wisconsin Center for Research and Development, has been in use since 1968. Designed for all pupils in grades K-8, the model replaces standard elementary classrooms with Instruction and Research Units and incorporates team teaching, continuous progress, flexible use of materials, ungradedness, and differentiated instructional roles in order to increase pupil learning and raise pupil and teacher morale.

New Directions in English, developed by Educational Development Corporation of Palo Alto and distributed by Harper and Row, School Department, has been in use since 1968. Designed for 50% of language students in grades 1 through 8, the program uses a guided discovery approach for students of average and above average ability and is linguistically oriented. Texts and workbooks comprise the materials produced, which represent a complete program to teach language and composition skills.

Off-Farm Agricultural Occupational Materials, developed by the Center for Research and Leadership Development in Vocational and Technical Education, have been in use since 1966. Designed for 50% of vocational education students in grades 11 and 12, the program provides course outlines and student materials in module form for several off-farm agricultural occupation courses.

The Open Court Correlated Language Arts Program was developed by the Open Court Publishing Company, and has been in use since 1965. Designed for all language pupils in grades 1 through 6, the program is strongly teacher-directed and strives to teach children to read independently by the end of first grade and attempts to provide selections of literary quality and rewarding content. Texts and manuals form the core of the program.

Operation Compu/Tel was developed by the Illinois Institute of Technology and has been in use since 1966. Designed for 25% of 8th through 12th grade mathematics students, the programmed text and computer hardware aid in teaching students to write computer programs using IITRAN and to solve mathematics problems with the programs.

The Palo Alto Reading Program, developed by the Palo Alto Unified School District and distributed by Harcourt Brace Jovanovich, Inc., has been in use since 1967. Designed for all language pupils in grades 1 through 3, the program represents an eclectic (basal and linguistic) approach to teaching reading skills and strives to make step-by-step progress possible for all pupils in beginning reading and writing. Materials include texts, workpads, guides, and kits.

Patterns and Processes of Science was developed by Weisbrack, Brock, and Paulsen and is distributed by D.C. Heath and Company. The materials have been in use since 1968 and are designed for 75% of 7th through 9th grade science students. Laboratory textbooks enable students to develop laboratory skills, perform and study experiments using scientific processes, and discover patterns in the universe.

Patterns in Arithmetic, developed by the Wisconsin Research and Development Center for Cognitive Learning, has been in use since 1967. Designed for all mathematics pupils in grades 1 through 6, the program utilizes a spiral sequence with behavioral objectives and televised instruction of key concepts in new mathematics. Materials include television presentation, workbooks, and teacher's manuals. Forty-five minutes daily participation is recommended.

People and Their Environment, developed by the J.G. Ferguson Publishing Company, has been in use since 1969. Designed for all students in all levels (K-12) of science and social studies, the program can be used as a complete or supplementary environmental studies curriculum. Its purpose is to acquaint students with nature and to teach them wise environmental management. Teacher manuals provide detailed lessons that attempt to integrate conservation in all subject areas.

Physical Science II was developed by Education Development Center and has been in use since 1970. Designed for 75% of science students in grades 9 through 12, the program extends the purpose of the Introductory Physical Science course (see above). Materials include texts, manuals, tests, and laboratory equipment and are available only to teachers trained in an approved institute or workshop.

Programmed Tutoring Reading, developed by Douglas Ellson of the University of Indiana, has been in operation since 1968. Programmed materials are aimed at improving the reading skills for 25% of first grade language pupils.

Project Insight: Human Relations Curriculum was developed by the PACE Association and has operated since 1966. Aimed at all social studies students in grades K-12, the program utilizes an open classroom and affective learning techniques. It can be used as a complete one-year program or as supplementary units, intended to help students and teacher respond to critical human relations incidents. Films, role-playing, and games are used.

Project Local (Laboratory Program for Computer-Assisted Learning), developed by Robert N. Haven and the Town of Westwood, Massachusetts, has been in use since 1969. Designed for 75% of 9th through 12th graders in mathematics, science, and social studies, the program strives to integrate use of the computer as a teaching aid for problem solving, class demonstration, and computer-based drill and practice into the regular curricula. Materials include a programmed text, teacher's manual, and resource materials.

Project PLAN (Program for Learning in Accordance with Needs), developed by John C. Flanagan and the American Institutes for Research and distributed by Westinghouse Learning Corporation, has been in operation since 1967. Designed for all grade 1 through 12 students in language, mathematics, science, social studies, and guidance, the program provides computer-managed individualized instruction as a complete curriculum or as separate subject area courses. Provided are computer support, teacher-training materials, teaching-learning units, tests, and recommendations for all necessary instructional materials.

Project Social Studies Materials, developed by Edith West of the Minnesota Curriculum Development Center, University of Minnesota and distributed by Green Printing Company, have been in use since 1970. Designed for all social studies students in grades K-12, the curriculum materials place increased emphasis on the behavioral sciences and the non-western world and aim at helping students develop inquiry skills as well as a sound knowledge of the social sciences. Materials include teacher guides and resource units.

The Providence Social Studies Curriculum Project Materials were developed by R.F. Skinn, Jr. of the Providence, Rhode Island Public Schools and are distributed by the Rhode Island College Bookstore. The program, in use since 1967, is designed for all social studies students in grades K-12 and strives to increase student activity and reduce traditional textbook reading, recitation, and testing in the learning of social studies skills and content. Emphasis is placed on individual and small group projects and student self-direction. Materials provided include curriculum guides and resource units; schools must purchase texts and pamphlets for the full 13-year course.

The Quantitative Approach to Elementary School Science, developed by Clifford E. Swartz of the State University of New York, Stony Brook, has been in use since 1970. Designed for all science pupils in grades 3 through 6, the program combines mathematics and science and treats only phenomena and concepts which can be seen or manipulated by the child in the teaching of elementary science. Materials include texts, kits, and teachers' guides.

Quantitative Physical Science was developed by Dr. Sherwood Githens, Jr. of Duke University and has been in use since 1967. Designed for all 9th grade science students, the course is an equipment-based learning program consisting of a series of 90 manipulative learning operations. The program serves as a transition between elementary and secondary science courses and strives to teach the student the fundamentals of instrumentation, measurement, and various scientific principles. A text and teacher's manual supplement laboratory equipment.

The Random Access Data Storage and Retrieval System, developed by Bruce R. Joyce of Columbia University Teachers College, has been in use since 1968. Designed for all social studies pupils in grades 2 through 6, the system gives pupils access to a large amount of information on the topic of Pueblo culture to enable them to study the culture easily and thoroughly. Materials include thousands of modules of information, tapes, slides, pictures, legends, dramatizations, and displays.

The Reading Caravan was developed by D.C. Heath and Company and has been in use since 1968. The program is designed for 75% of 1st through 6th grade language pupils. This seven-book supplementary reading series with accompanying records are aimed at developing pupils' basic reading skills.

The Responsive Environment Model, developed by Glen Nimnicht of the Far West Laboratory for Educational Research and Development, has been in operation since 1968. Designed for all grade K-3 pupils in language, mathematics, science, and social studies, the model represents a complete program for early childhood and psycho-social development. Using a self-directed approach, the program strives to allow the child to explore and make discoveries of his own. Materials include texts, audio-visual aids, kits, games, and displays. Local school advisors require two weeks of training.

Science: A Process Approach was developed by the American Association for the Advancement of Science Commission on Science Education and has been in use since 1967. Designed for all science pupils in grades K-6, this is a complete program to be used in a designated sequence, stressing the intellectual processes of science organized as hierarchies of skills and subskills. Student performance is evaluated by means of behavioral objectives. No reading is involved; lessons progress through demonstrations, activities, discussions, and evaluation.

The Science Curriculum Improvement Study Materials, developed by the University of California at Berkeley, have been in use since 1968. Designed for all science pupils in grades K-6, the materials may be used as a complete science curriculum or as supplementary units. Life and physical science concepts are developed through direct "discovery" experiences led by the teacher. One and one-half hours of weekly instruction are recommended. Manuals, laboratory equipment, kits, and workbooks comprise the materials.

The Secondary School Mathematics Curriculum Improvement Study Materials, developed by Columbia University Teachers College, have been in use since 1968. Designed for 25% of grade 9 through 12 mathematics students, the program aims at university-bound students and includes large amounts of current university study. Textbooks comprise the means of instruction.

The Secondary School Science Project Materials were developed by Rutgers University and have been in use since 1966. Designed for all science students in grades 8 through 10, the program emphasizes what the student himself is able to do given access to primary sources of information. The course is designed to help the student reach some understanding of the physical world and to experience firsthand the investigative nature of science. Student Investigation Books and paperbacks take the place of standard texts.

A Self-Instructional System in Basic Electricity, developed by the Northwest Regional Educational Laboratory, has been in use since 1968. Designed for 25% of vocational education students in grades 7 through 12, the program strives to assist students to acquire fundamental concepts of electricity and how they are applied in daily life. Programmed teaching techniques and devices permit each student to proceed at his own pace for the average four-week, 12-hour course. Materials include audio-visual aids, workbooks, test, guides, and equipment.

A Self-Instructional System in Speech, developed by the Northwest Regional Educational Laboratory, has been in use since 1968. Designed for 75% of language students in grades 7 through 12, the program strives to assist students in acquiring the basic skills in public speaking. The system can be incorporated into a beginning speech course or used by individual students. Materials include films and programmed units of instruction.

A Self-Instructional System in Welding was developed by the Northwest Regional Educational Laboratory and has been in use since 1968. Designed for 25% of vocational education students in grades 9 through 12, the program strives to provide students with the basic skills of electric arc welding through self-instruction. The system can be used as a self-contained unit or combined with an existing course. The program uses a variety of media, including printed, audio and visual materials and variable step sizes in the learning sequence. The teacher/manager need not be highly skilled in welding.

The Self-Understanding Through Occupational Exploration Program, developed by the Oregon State Department of Education, has been in use since 1967. Designed for all vocational education students in grades 8 and 9, the goal of the program is to enable students to examine their own capabilities and interests and many career possibilities in order to make tentative career cluster decisions and to design their own educational and training programs. The teacher's guide provides complete recommendations for materials to be used.

Sesame Street was developed by Children's Television Workshop and has been on the air since 1970. Designed for all pupils in language and mathematics in kindergarten and first grade, the daily, hour-long color television series strives to enhance children's cognitive skills by means of frequent repitition of spot "commercials" and commercial TV entertainment techniques. Books and records are also produced.

Social Sciences: Concepts and Values, developed by Paul Brandwein of Harcourt, Brace, & World, has been in use since 1970. Designed for all social studies pupils in grades K-6, the program presents a sequential series of materials organized around key social science concepts and values. Student and teacher texts comprise the materials.

The Sullivan Reading Program, developed by M.W. Sullivan and distributed by Behavioral Research Laboratories, has been in use since 1967. Designed for all levels of language students who require improved reading skills, the program uses a programmed, linguistic approach with emphasis on decoding skills. Materials include texts, tests, and displays.

The Taba Curriculum Development Project Materials, developed by San Francisco State College, have been in use since 1969. Designed for all social studies pupils in grades 1 through 8, the program strives to develop students' thinking skills, allow acquisition of selected knowledge, and form selected attitudes. Materials consist of a series of curriculum guides in the form of teaching-learning units.

Taking a Stand (Oliver Materials) was developed by the Harvard Social Studies Project and is distributed by American Education Publications. It has been in use since 1967. Designed for 50% of 7th through 9th grade social studies students, the program uses critical thinking, social science, law, and philosophical concepts to teach students to develop opinions on controversial public issues. Films and pamphlets comprise the materials.

The Talking Typewriter, developed by Omar K. Moore and Responsive Environments Corporation, has been in use since 1965. Designed for 75% of language pupils in grades K-6, the program allows children to proceed with reading skills at their own pace, encourages participation, and elicits responses in the non-threatening atmosphere of a private booth. Materials include a special typewriter keyboard and other computer components.

The Technology for Children Project Materials, developed by Fred J. Dreves and the New Jersey State Department of Education, Vocational Division, has been in use since 1968. Designed for all kindergarten-3rd grade pupils, the program strives to enlarge the child's understanding of vocational choice and to develop his economic competence in a changing world of work.

Total Education in the Total Environment Materials were developed by William R. Eblen of the Wilton, Connecticut Public Schools and have been in use since 1968. Designed for all mathematics, science, and social studies students in grades K-12, the program strives to enable students to develop an appreciation of their interdependence with their total environment and to encourage responsibility for maintaining a livable environment. Materials include manuals, workbooks, and audio-visual aids.

Total Reading, developed by Mary Johnston and Ruth Scanlon of Carmel, California, has been in use since 1965. Designed for all language pupils in grades 1 through 3, the texts integrate the teaching of reading, writing, spelling, and speech through an understanding of the phonetic components of English. Pupils work independently at early stages. Texts and tests comprise the materials.

UNIPAC was developed by the Kettering Foundation's Institute for Development of Educational Activities and has been in use since 1968. Designed for all pupils in all areas at all levels, materials consist of individualized learning packages written by teachers in all parts of the country.

The University of Illinois Astronomy Program, developed by James Atkin of the University of Illinois and distributed by Harper and Row, School Department, the program has been in use since 1970. Designed for 75% of science students in grades 5 through 10, the program can be used as six study units to supplement a regular course or as a complete one-year course. The units employ a "story-line" approach, unfolding the history of astronomy; of scientists acquiring understanding of the solar system, stars, and galaxies; behavior of light; and gravitation.

Variable Modular Scheduling via Computer, developed by Stanford University and Educational Coordinates, has been in use since 1967. Designed for all pupils in all areas and at all levels, the program allows students to schedule flexible class periods and work within a curriculum removed from the rigid confines of six standard class periods per day.

Vocational Information for Education and Work, developed by Appalachia Educational Laboratory, Inc., has been in use since 1967. Designed for 75% of vocational education students in grades 9 through 12, the materials supply students with occupational information on jobs requiring less than a college degree for which training is available regionally and/or there is an accelerating need for workers. Materials include microfiche scripts.

The World of Language, developed by Follett Educational Corporation and in use since 1970, was designed for all language pupils in grades K-8. A complete program in language arts, materials emphasize the oral aspects of language and aim at increasing pupils' skills relating to communication, language, cognitive development, human relations, and literature. Materials include poems, stories, art work, and photographs.

APPENDIX E

DETAILED DESCRIPTION OF THE 117 SELECTED PRODUCTS

The following codes are used in the table presented below that describes each of the 117 selected products. See the text for further definitions of the data items.

1. Focus

SM.	Subject Matter Content
O.	Organizational Efficiency
CO.	Classroom Climate or Operation
LPM.	Learning Procedures or Methodology
PM.	Perceptual-Motor Skills

2. Content

L.	Language
M.	Mathematics
S.	Science
SS.	Social Studies
VE.	Vocational Education

3. Format

TB.	Textbooks (teacher and student editions)
W.	Workbooks (including laboratory books, supplementary worksheets)
M.	Manuals, guides
TV.	Television series
F.	Films (includes movies, filmloops, filmstrips, slides)
A.	Audio equipment (includes records, tapes, cassettes)
D.	Displays (includes charts, graphs, models, maps, globes, atlas, flash cards)
G.	Games
K.	Kits
C.	Computer hardware and software
L.	Laboratory equipment
T.	Tests

4. Grade Level

Grade level K (kindergarten) through 12 is shown.

5. Percent of Target Population

Coded as 25%, 50%, 75%, or 100%

6. Number of Schools

The actual number of schools using the product is noted.

7. Number of Students

Number of students using the product is noted.

8. Degree of Dissemination

H. High degree of dissemination (i.e., product brought to the attention of the educational profession through more than 10 known sources).

M. Moderate degree of dissemination (i.e., 6-9 sources).

L. Low degree of dissemination (i.e., 2-5 sources).

9. Year Came Into Use

The year (i.e., 1965-1970) the product was first adopted is noted.

10. Measured Cognitive Gains--Nominator

Y. Yes

N. No

DK. Don't Know

11. Measured Cognitive Gains--Evidence

For each product, one (the most positive one) of the following letter codes was used:

PP-ST-C. Pre- and post standardized test measures with control groups.

PP-ST. Pre- and post standardized test measures without control groups.

PP-PT-C. Pre- and post product test measures (i.e., criterion tests or other measures or indicators of performance specified as evidence of attainment of the product objectives) with control groups.

PP-PT.	Pre- and post product test measures without control groups.
P-PT-C.	Post only product test measures with control groups.
P-PT.	Post only product test measures without control groups.
UNSP.	Unspecified gain--gain not hypothesized by evaluator.
NE.	Negative evidence on effectiveness of product.
DK.	Don't Know--no evidence found by staff.

12. Sustained Cognitive Gains--Evidence

For each product, one (the most positive one) of the following letter codes was used:

RMS.	Repeated (i.e., two or more tests or measures) measures via standardized tests.
PPS.	Pre- and post-measures via standardized tests.
RMP.	Repeated measures of product tests.
PPP.	Pre- and post-measures via product (criteria) tests.
P.	Post only measure.
DK.	Don't Know.

13. Measured Affective Gains--Nominator

Y.	Yes
N.	No
DK.	Don't Know

14. Measured Affective Gains--Evidence

For each product, one (the most positive one) of the following letter codes was used:

PP-PT-C.	Pre- and post-measures via product test with control groups.
PP-PT.	Pre- and post-measures via product test without control groups.
P-PT-C.	Post-only measures via product (criterion) test with control group.
P-PT.	Post-only measures via product test without control groups.
UNSP.	Unspecified gain--gain not expected or hypothesized.
NE.	Negative evidence on effectiveness of product.
DK.	Don't Know.

15. Sustained Affective Gains--Evidence

For each product, one (the most positive one) of the following letter codes was used:

RMP.	Repeated (i.e., two or more tests or measures) measures of the product tests.
PPP.	Pre- and post-measures via product test.
P.	Post-only measure.
DK.	Don't Know.

16. Contributed Toward Gains--Nominator

"Don't Know" was marked if the nominator indicated "Don't Know" for all of the areas; otherwise, "Yes" or "No" was indicated for each area for which the nominator marked "Yes" or "No." The following are the relevant code letters:

OY.	Marked Yes to Organizational Efficiency.
ON.	Marked No to Organizational Efficiency.
ODK.	Marked Don't Know to Organizational Efficiency.
COY.	Marked Yes to Classroom Climate or Operation.
CON.	Marked No to Classroom Climate or Operation.
CODK.	Marked Don't Know to Classroom Climate or Operation.
LPMY.	Marked Yes to Learning Procedures or Methodology.
LPMN.	Marked No to Learning Procedures or Methodology.
LPMDK.	Marked Don't Know to Learning Procedures or Methodology.
PMY.	Marked Yes to Perceptual-Motor Skills.
PMN.	Marked No to Perceptual-Motor Skills.
PMDK.	Marked Don't Know to Perceptual-Motor Skills.

17. Contributed Toward Gains--Evidence

"Don't Know" was marked if no supporting evidence was available for all four areas; otherwise, "Yes" or "No" was indicated for each area for which additional information was available. The following are the relevant code letters:

OY.	Organizational Efficiency; Yes, evidence found.
ON.	Organizational Efficiency; No, evidence not found.
ODK.	Organizational Efficiency; Don't Know.
COY.	Classroom Climate or Operation; Yes, evidence found.
CON.	Classroom Climate or Operation; No, evidence not found.
CODK.	Classroom Climate or Operation; Don't Know.

LPMY. Learning Procedures or Methodology; Yes, evidence found.

LPMN. Learning Procedures or Methodology; No, evidence not found.

LPMDK. Learning Procedures or Methodology; Don't Know.

PMY. Perceptual-Motor Skills; Yes, evidence found.

PMN. Perceptual-Motor Skills; No, evidence not found.

PMDK. Perceptual-Motor Skills; Don't Know.

18. Developer

The type of agency was coded as follows:

G. Government (including R&D laboratories and centers, state universities, state departments, etc.)

PNP. Private Non-Profit (e.g., AIR, ETS, Ford Foundation).

PPM. Private Profit-Making (e.g., publishers, individual enterprises).

19. Location of Developer

NE. Northeast (includes USOE Regions 1, 2, and 5: Connecticut, Delaware, Illinois, Indiana, Massachusetts, Michigan, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Puerto Rico, Rhode Island, Vermont, Wisconsin).

SE. Southeast (includes USOE Regions 3 and 4: Alabama, Florida, Georgia, Kentucky, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, Virgin Islands, West Virginia).

SC. South Central (includes USOE Region 7: Arkansas, Louisiana, New Mexico, Oklahoma, Texas).

NC. North Central (includes USOE Regions 6 and 8: Colorado, Idaho, Iowa, Kansas, Minnesota, Missouri, Montana, Nebraska, North Dakota, South Dakota, Utah, Wyoming).

W. West (includes USOE Regions 9 and 10: Alaska, Arizona, California, Guam, Hawaii, Nevada, Oregon, American Samoa, Trust Territory of the Pacific, Washington).

Name of Product / Descriptors	Focus	Content	Format	Grade Level	% of Target Population	Number of Schools	Number of Students	Degree of Dissemination	Year Came Into Use	Measured Cognitive Gains--Nominator	Measured Cognitive Gains--Evidence	Sustained Cognitive Gains--Evidence	Measured Affective Gains--Nominator	Measured Affective Gains--Evidence	Sustained Affective Gains--Evidence	Contributed Toward Gains--Nominator	Contributed Toward Gains--Evidence	Developer	Location of Developer
America: A Modern History of the U.S.	SM	SS	T,TB,A	11	75	1,000	85,000	L	1970	DK	DK	DK	DK	DK	DK	LPMY,PMY	DK	PPM	NE
Amherst Project Materials	SM	SS	T,A,F,M	9-12	75	250	15,000	M	1970	Y	DK	DK	Y	DK	DK	DK	DK	PNP	NE
Anthropology Curriculum Project Materials	SM	SS	TB,W,M A,D,T	K-12	100	95	50,000	L	1965	Y	PP-PT-C	DK	N	DK	DK	DK	DK	G	SE
Anthropology Curriculum Study Project Materials	SM	SS	TB,W,F A,D	7-12	100	150	10,000	M	1968	Y	DK	DK	DK	DK	DK	DK	DK	PNP	NE
A Place to Live	SM	S	W,M	4-6	100	100	10,000	L	1970	Y	DK	DK	DK	DK	DK	DK	DK	PNP	NE
Arithmetic Proficiency Training Program	SM	M	C,M	1-8	100	20	5,000	L	1970	Y	PP-ST-C	RMS	Y	P-PT	P	COY,LPMY PMY	COY	PPM	NE
Bank Street College of Education Model	LPM, CO	L,M,S SS	M	K-3	50	60	6,000	L	1969	DK	DK	DK	DK	DK	DK	COY	DK	PNP	NE
Behavioral Analysis Model	LPM, CO	L,M,S SS	M	K-3	100	110	10,000	M	1968	DK	DK	DK	DK	DK	DK	COY	DK	G	NC
BSCS Lab Blocks	SM	S	TB,W, M,T	9-12	75	1,000	1,000,000	H	1968	Y	DK	DK	DK	DK	DK	OY,COY, LPMY,PMY	DK	G	NC
Center for Environmental Education Materials	SM	S,SS	TB,K,M	K-12	100	150	15,000	L	1967	Y	DK	DK	DK	DK	DK	DK	DK	PNP	NC
Chemistry: Experiments and Principles	SM	S	TB,T,F, M	11-12	25	2,000	100,000	H	1968	Y	DK	DK	DK	DK	DK	COY,LPMY	DK	G	W
Cluster Concept Program	SM	VE	M,T	11-12	50	100	10,000	H	1968	Y	PP-PT-C	DK	DK	DK	DK	DK	DK	G	SE
Comprehensive School Math Program	SM	M	TB,F,G A,K	K-12	100	10	1,500	M	1970	Y	DK	DK	DK	DK	DK	DK	DK	G	NC
CAI Drill & Practice: Elementary Math	SM	M	C,TB	1-6	100	16	3,000	M	1967	Y	DK	DK	DK	DK	DK	DK	DK	PNP	W
CAI: Elementary English	SM	L	C	4-6	100	34	1,500	L	1969	Y	DK	DK	DK	DK	DK	OY,COY,LPMY	DK	PPM	SE
CAI: Language Arts	SM	L	C	4-8	75	15	1,000	L	1968	Y	DK	DK	DK	DK	DK	DK	DK	PNP	W
Conceptually Oriented Program in Elementary Science	SM	S	M,W	K-6	100	50	3,000	L	1969	Y	DK	DK	DK	DK	DK	DK	DK	PNP	NE
Coordinated Helps in Language Development	LPM	L	M	K	50	15	500	L	1970	Y	DK	DK	DK	DK	DK	DK	DK	G	W
Correlated Curr. Project Materials	SM	VE	DK	9-12	50	11	3,500	L	1966	Y	DK	DK	Y	DK	DK	DK	DK	G	NE

Name of Product / Descriptors	Focus	Content	Format	Grade Level	% of Target Population	Number of Schools	Number of Students	Degree of Dissemination	Year Came Into Use	Measured Cognitive Gains--Nominator	Measured Cognitive Gains--Evidence	Sustained Cognitive Gains--Evidence	Measured Affective Gains--Nominator	Measured Affective Gains--Evidence	Sustained Affective Gains--Evidence	Contributed Toward Gains--Nominator	Contributed Toward Gains--Evidence	Developer	Location of Developer
Creative Learning Group Drug Education Program	SM	SS	TB,M,F,A	6-10	100	150	15,000	H	1970	Y	PP-PT	DK	DK	DK	DK	DK	DK	PNP	NE
Dangerous Parallel	SM	SS	G	9-12	100	50	5,000	L	1969	Y	DK	DK	Y	DK	DK	DK	DK	PPM	NE
Dem. & Exp. in Computer Training & Their Use in Sec. Schools Materials	SM	L,M,SS S	TB,M,W,C	9-12	100	18	400	L	1968	Y	DK	DK	DK	DK	DK	DK	DK	PNP	NE
Development of Economic Education Programs	SM	SS	TB,M,W,F	K-12	100	850	1,000,000	M	1969	Y	DK	DK	DK	DK	DK	DK	OY,LPMY	G	NE
Development of Higher Level Thinking Abilities	CO, LPM	L,SS	M,W,F,A	2-12	100	300	10,000	L	1967	Y	DK	DK	DK	DK	DK	COY,LPMY	DK	G	W
Discovery Approach to American History	SM	SS	TB,A,M,T	8-11	75	30	9,000	L	1968	DK	DK	DK	DK	DK	DK	COY,ON LPMY	DK	PNP	NE
DISTAR	SM	L,M	M	K-2	50	3,000	150,000	H	1969	Y	PP-ST-C PP-PT-C	RMS RMP	Y	P-PT	P	COY,LPMY PMY	COY	PPM	NE
Drug Abuse Curr. Materials	SM	SS	M,W	K-12	100	25	30,000	L	1970	Y	DK	DK	DK	DK	DK	DK	DK	G	SC
Drug Decision	SM	S,SS	F,W,G	6-10	100	130	100,000	H	1969	Y	PP-PT	DK	Y	DK	DK	DK	DK	PPM	W
Drug Experience Program	SM	SS	TB,M	6-12	100	50	25,000	M	1970	Y	DK	DK	DK	DK	DK	DK	DK	PPM	NE
Earth Science Curr. Project Materials	SM	S	TB,M,F,L	8-10	100	3,500	300,000	M	1968	Y	DK	DK	DK	DK	DK	DK	DK	G	NC
Economic Man	SM	SS	TB,M,G	6-8	100	20	15,000	M	1970	Y	DK	DK	DK	DK	DK	DK	DK	G	NE
EDC Follow-Through Model	CO, LPM	L,M,S SS	M	K-3	100	25	75,000	H	1969	Y	DK	DK	DK	DK	DK	COY,LPMY	DK	G	NE
Educational Programming of Cultural Heritage	SM	SS	TB,F,A,D	K-6	100	30	5,000	L	1966	Y	DK	DK	DK	DK	DK	DK	DK	G	W
ERC Science Program	SM	S	TB,G,M	K-12	100	15	5,656	M	1967	Y	DK	DK	DK	DK	DK	DK	DK	G	NE
Elementary Science Study	SM	S	F,TB,D,L, M	K-8	100	1,000	100,000	M	1965	Y	DK	DK	DK	DK	DK	DK	DK	G	NE
Facilitating Inquiry in the Classroom	LPM	S	M,W,A	K-12	100	100	10,000	L	1967	Y	DK	DK	DK	DK	DK	COY,LPMY	DK	G	W
Field Social Studies Program	SM	SS	TB	K-12	100	1,200	250,000	L	1970	Y	DK	DK	DK	DK	DK	DK	DK	G	W
First Year Comm. Skills	SM	L	TB,D,G,M	K	100	321	33,000	L	1967	Y	PP-PT-C	RMP	DK	DK	DK	COY,LPMY	DK	G	W
Frostig Perceptual-Motor Development Program	PM, LPM	L,M,S SS	TB,M,F,A, D,G,T	K-2	75	500	200,000	M	1969	Y	PP-ST-C	RMP	Y	P-PT	RMP	PMY	PMY	PPM	W

Name of Product / Descriptors	Focus	Content	Format	Grade Level	% of Target Population	Number of Schools	Number of Students	Degree of Dissemination	Year Came Into Use	Measured Cognitive Gains--Nominator	Measured Cognitive Gains--Evidence	Sustained Cognitive Gains--Evidence	Measured Affective Gains--Nominator	Measured Affective Gains--Evidence	Sustained Affective Gains--Evidence	Contributed Toward Gains--Nominator	Contributed Toward Gains--Evidence	Developer	Location of Developer
Glen Haven Training Program	LPM, PM	L,M,S SS	M,F	K-6	25	25	25,000	M	1969	Y	PP-ST-C	DK	Y	P-PT	DK	PMY	PMY	PPM	NC
Greater Cleveland Social Studies	SM	SS	TB,M,F,A	K-6	100	150	110,000	H	1970	Y	DK	RMS	DK	DK	DK	DK	DK	G	NE
Harvard Project Physics	SM	S	TB,L,F,T,M	9-12	100	400	5,000	L	1969	Y	DK	DK	DK	DK	DK	DK	DK	PNP	NE
Hawaii English Project	SM	L	TB,W,A,F, D,G,T	K-12	100	160	13,000	M	1970	Y	PP-ST-C PP-PT-C	RMS	Y	P-PT	P	OY,COY LPMY	COY	G	W
Heath Urban Reading Program	SM	L	TB	7-9	25	15	500	H	1970	DK	DK	DK	DK	DK	DK	OY,COY,LPMY,PMY	DK	PPM	W
H.S. Geography Project Materials	SM	SS	TB,M,F,A,W	9-12	100	1,500	1,000,000	M	1969	Y	DK	DK	DK	DK	DK	DK	DK	G	NC
Human Relations Training Unit	LPM	SS	F,TB,M	9-12	75	20	6,000	L	1970	DK	DK	DK	DK	DK	DK	COY	DK	G	W
Idea-Centered Lab Science Materials	SM	S	TB,T	7-8	50	18	1,000	H	1967	Y	DK	DK	DK	DK	DK	DK	DK	G	NE
I Know a Place	SM	L,SS	TB	3	100	150	8,000	L	1969	Y	DK	DK	DK	DK	DK	COY	DK	PPM	NE
Improving Motor-Perceptual Skills	PM	M,S,SS L,VE	M	K	100	15	500	L	1970	DK	DK	DK	DK	DK	DK	PMY	DK	G	W
Individualized Math. System	SM	M	TB	1-6	100	25	5,000	L	1970	DK	DK	DK	DK	DK	DK	OY,COY	DK	G	SE
IPI Mathematics	SM	M	T,TB,A,F, K,D	K-6	100	175	50,000	H	1967	Y	PP-ST-C	RMS	DK	P-PT	DK	COY,LPMY PMY	COY,OY LPMY	G	NE
Inquiry Dev't Program in Earth Science	SM	S	TB,K,W,F,M	8-10	50	1,000	100,000	L	1968	DK	DK	DK	DK	DK	DK	COY,LPMY	DK	PPM	NE
Inquiry Dev't Program in Physical Sciences	SM	S	TB,K,W,F,M	6-8	100	1,000	100,000	L	1966	DK	DK	DK	DK	DK	DK	COY,LPMY	DK	PPM	NE
Inquiry Role Approach	SM	S	M,A,F	10	75	20	4,000	L	1968	Y	DK	DK	DK	DK	DK	OY,COY,LPMY	DK	G	NC
Instructional Concepts Program	SM	L	DK	K	100	14	1,400	L	1970	Y	DK	DK	DK	DK	DK	OY,COY LPMY,PMY	DK	G	W
Intergroup Relations Curr.	SM	SS	TB,D,M,F	1-6	100	500	100,000	H	1970	Y	DK	DK	DK	PP-PT	DK	DK	LPMY	PNP	NE
Intermediate Science Curr. Study Materials	SM	S	K,M,T	7-9	100	300	100,000	H	1970	Y	DK	DK	DK	DK	DK	OY,LPMY	LPMY	G	SE
Interrelated Math-Science Project Materials	SM	M,S	K,M	9-12	100	5	6,500	L	1969	Y	DK	DK	DK	DK	DK	DK	LPMY	G	SE
Introductory Physical Sci.	SM	S	TB,M,T,F,L	8-9	100	7,000	700,000	L	1966	Y	DK	DK	DK	DK	DK	DK	DK	PNP	NE
Language Master	SM	L,M	A	K-12	100	1,000	50,000	H	1965	Y	DK	DK	DK	DK	DK	COY,PMY LPMY	DK	PPM	W

Name of Product / Descriptors	Focus	Content	Format	Grade Level	% of Target Population	Number of Schools	Number of Students	Degree of Dissemination	Year Came Into Use	Measured Cognitive Gains--Nominator	Measured Cognitive Gains--Evidence	Sustained Cognitive Gains--Evidence	Measured Affective Gains--Nominator	Measured Affective Gains--Evidence	Sustained Affective Gains--Evidence	Contributed Toward Gains--Nominator	Contributed Toward Gains--Evidence	Developer	Location of Developer
The Learning Booth	SM	L	L,G,K	K-1	100	65	1,000	M	1969	Y	P-PT	DK	DK	DK	DK	DK	LPMY,PMY	G	W
Learning Mastery System	SM	L	DK	1	100	455	41,500	L	1967	Y	DK	DK	DK	DK	DK	COY,LPMY	DK	G	W
Listening-Reading Program	SM	L	DK	1-3	100	350	33,500	H	1970	DK	DK	DK	DK	DK	DK	COY,PMY,LPMY	DK	PPM	NE
LLL	SM	L	DK	K-5	75	250	12,000	L	1966	Y	DK	DK	DK	DK	DK	COY,PMY,LPMY	DK	PPM	NE
Man: A Course of Study	SM	SS	M,G,F,A,K	5-7	100	10	1,500	L	1970	DK	DK	DK	DK	DK	DK	LPMY	DK	PNP	NE
Man in Action	SM	SS	TB,M	K-6	100	150	25,000	M	1968	Y	P-PT	DK	Y	P-PT	DK	DK	COY,LPMY	G	W
The Man Made World	SM	S	TB,M,L,G,T	10-12	75	175	7,000	L	1969	Y	DK	DK	DK	DK	DK	DK	DK	PNP	NE
Materials & Activities for Teachers & Children	SM	SS	M,K,F,G,A	K-6	100	400	20,000	M	1965	Y	DK	DK	DK	DK	DK	DK	DK	PNP	NE
Math: Modern Concepts & Skills	SM	M	TB	7-9	25	1,500	150,000	M	1969	DK	DK	DK	DK	DK	DK	COY,PMY,LPMY	DK	PPM	NE
Merill Linquistic Reading Program	SM	L	TB	1-3	100	5,000	1,000,000	H	1966	Y	PP-ST-C	DK	DK	DK	DK	DK	DK	PPM	NE
Michigan Social Science Education Project Materials	SM	SS	TB,A,M	4-6	100	800	75,000	M	1968	Y	DK	DK	DK	DK	DK	DK	DK	G	NE
Mike's World - Your World	SM	S	TB,G	5-6	100	20	1,200	L	1969	Y	DK	DK	DK	DK	DK	DK	DK	PPM	NE
Minn. Math & Science Teaching Project	SM	M,S	TB,F,G,L	K-3	100	500	50,000	H	1966	Y	DK	DK	DK	DK	DK	DK	DK	G	NC
Movigenic Orientation	PM	L,M S,SS	DK	K-12	100	30	10,000	M	1967	Y	PP-PT	DK	Y	DK	DK	PMY	PMY	PPM	W
Multiunit Elementary School	O,CO LPM	L,M S,SS	TB,F,A	K-8	100	200	66,000	M	1968	Y	P-PT	DK	DK	P-PT	DK	OY,COY LPMY	OY,COY LPMY	PNP	NE
New Directions in English	SM	L	TB,T,W	1-8	50	1,500	50,000	L	1968	DK	DK	DK	DK	DK	DK	COY	DK	PPM	W
Off-Farm Agricultural Occupational Materials	SM	VE	M	11-12	50	300	6,000	H	1966	DK	DK	DK	DK	DK	DK	LPMY	DK	G	NE
Open Court Correlated Language Arts Program	SM	L	TB,M,P	1-6	100	150	20,000	L	1965	Y	PP-ST-C	DK	DK	P-PT	DK	DK	DK	PPM	NE
Operation COMPU/Tel	SM	M	DK	8-12	25	30	6,000	L	1966	Y	DK	DK	DK	DK	DK	OY,COY,LPMY,PMY	DK	PNP	NE
Palo Alto Reading Program	SM	L	M,TB,W,D	1-3	100	10	1,500	L	1967	Y	DK	DK	DK	DK	DK	DK	DK	G	W
Pattern & Processes of Science	SM	S	TB	7-9	75	500	150,000	H	1968	Y	DK	DK	DK	DK	DK	OY,COY LPMY,PMY	DK	PPM	NE
Patterns in Arithmetic	SM	M	F,W,M,TV	1-6	100	3,000	300,000	M	1967	Y	DK	DK	DK	DK	DK	DK	DK	G	NE
People & Their Environment	LPM	SS	M	K-12	100	1,000	400,000	L	1969	Y	DK	DK	DK	DK	DK	DK	DK	PPM	NE
Physical Science II	SM	S	TB,M,L,T	9-12	75	50	2,000	L	1970	Y	DK	DK	DK	DK	DK	DK	DK	PPM	NE

Name of Product / Descriptors	Focus	Content	Format	Grade Level	% of Target Population	Number of Schools	Number of Students	Degree of Dissemination	Year Came Into Use	Measured Cognitive Gains--Nominator	Measured Cognitive Gains--Evidence	Sustained Cognitive Gains--Evidence	Measured Affective Gains--Nominator	Measured Affective Gains--Evidence	Sustained Affective Gains--Evidence	Contributed Toward Gains--Nominator	Contributed Toward Gains--Evidence	Developer	Location of Developer
Program Tutoring in Reading	SM	L	DK	1	25	50	5,000	M	1968	Y	DK	DK	DK	DK	DK	LPMY	DK	G	NE
Project Insight: Human Relations Curr.	SM	SS	F,A,G,M	K-12	100	100	12,000	M	1966	Y	DK	DK	DK	P-PT	DK	COY	LPMY	PNP	NE
Project Local	SM	M,S,SS	C,M,TB	9-12	75	30	2,400	L	1969	Y	DK	DK	DK	DK	DK	DK	DK	G	NE
Project PLAN	SM,O,PM CO,LPM	L,M, S,SS,VE	C,TB,F, T,G,K,M W,D,A	1-12	100	175	15,000	H	1967	Y	PP-ST-C	RMS	Y	P-PT	DK	OY,COY LPMY	COY,OY LPMY	PNP	W
Project Social Studies	SM	SS	M,K	K-12	100	100	10,000	M	1970	Y	DK	DK	Y	DK	DK	DK	DK	G	NC
Providence Social Studies	SM	SS	M,K,F,A	K-12	100	125	28,000	L	1967	Y	DK	DK	DK	DK	DK	DK	DK	G	NE
Quant Approach to Elementary School Science	SM	S	TB,M,L,W	3-6	100	500	25,000	L	1970	Y	DK	DK	DK	DK	DK	DK	DK	G	NE
Quant Physical Science	SM	S	L,TB,M,W	9	100	56	10,000	M	1967	Y	P-PT	DK	DK	P-PT	DK	DK	DK	PNP	SE
Random Access Data Storage & Retrieval System	SM	SS	TB,A,F,D	2-6	100	5	300	M	1968	Y	DK	DK	DK	DK	DK	DK	DK	PNP	NE
Reading Caravan	SM	L	DK	1-6	75	10,000	100,000	H	1968	Y	DK	DK	DK	DK	DK	COY,LPMY,PMY	DK	PPM	NE
Resp. Environment Model	SM PM	L,M,S SS	TB,F,A,K, G,D	K-3	100	200	10,000	H	1968	Y	DK	DK	DK	DK	DK	DK	LPMY,COY PMY	G	W
Science: A Process Approach	SM	S	TB,K,T	K-6	100	5,000	1,500,000	H	1967	Y	DK	DK	DK	DK	DK	COY,PMY,LPMY	DK	PNP	NE
Science Curr. Improvement Study Materials	SM	S	M,L,W,K	K-6	100	15,000	350,000	H	1968	Y	DK	DK	DK	P-PT	DK	OY,COY LPMY	LPMY,PMY	G	W
Sec. School Math Curr. Improvement Study Materials	SM	M	TB	9-12	25	5	250	M	1968	Y	DK	DK	DK	DK	DK	DK	DK	PNP	NE
Sec. School Science Project	SM	S	TB,L,M	8-10	100	500	100,000	H	1966	Y	DK	DK	DK	DK	DK	DK	DK	PNP	NE
Self-Instruction System in Basic Electricity	SM	VE	M,F,A,W, T,L	7-12	25	8	230	L	1968	Y	PP-PT	DK	DK	P-PT	DK	LPMY,PMY	LPMY,PMY	G	W
Self-Inst. System in Speech	SM PM	L	F,A,TB,M	7-12	75	8	230	L	1968	Y	PP-PT-C	DK	DK	P-PT	DK	LPMY	LPMY	G	W
Self-Inst. System in Welding	SM	VE	F,A,TB,M,L	9-12	25	8	192	L	1968	Y	PP-PT	DK	DK	P-PT	DK	LPMY,PMY	LPMY,PMY	G	W
Self Understanding through Occupational Exploration Program	SM	VE	DK	8-9	100	25	2,000	L	1967	DK	DK	DK	Y	DK	DK	DK	DK	G	W

Name of Product / Descriptors	Focus	Content	Format	Grade Level	% of Target Population	Number of Schools	Number of Students	Degree of Dissemination	Year Came Into Use	Measured Cognitive Gains--Nominator	Measured Cognitive Gains--Evidence	Sustained Cognitive Gains--Evidence	Measured Affective Gains--Nominator	Measured Affective Gains--Evidence	Sustained Affective Gains--Evidence	Contributed Toward Gains--Nominator	Contributed Toward Gains--Evidence	Developer	Location of Developer
Sesame Street	SM	L,M	TV, K	K-1	100	25	6,000,000	H	1970	Y	PP-ST-C	RMS	DK	DK	DK	ON,CON LPMY,PMY	DK	PNP	NE
Social Science: Concepts and Values	SM	SS	TB	K-6	100	500	50,000	M	1970	Y	P-PT	DK	DK	DK	DK	DK	DK	PPM	NE
Sullivan Reading Program	SM	L	TB,D,K	K-12	100	35,000	5,000,000	H	1967	Y	PP-PT-C	DK	DK	DK	DK	DK	DK	PPM	W
Taba Curriculum Development Project Materials	SM	SS	M,TB	1-8	100	200	50,000	H	1969	Y	DK	DK	DK	DK	DK	DK	DK	G	W
Taking a Stand	SM	SS	TB	7-9	50	30	6,000	H	1967	DK	DK	DK	DK	DK	DK	COY,LPMY	DK	PNP	NE
Talking Typewriter	SM	L	C,M,T	K-6	75	50	10,000	M	1965	Y	PP-ST-C	DK	DK	DK	DK	DK	DK	PPM	NE
Technology for Children Project Materials	SM	L,M S,SS	F,M	K-6	100	73	3,240	L	1968	Y	DK	DK	DK	DK	DK	DK	DK	G	NE
Total Education in the Total Environment Materials	SM	M,S,SS	W,M,A,F	K-12	100	15	5,000	L	1968	Y	DK	DK	DK	PP-PT	DK	DK	LPMY	G	NE
Total Reading	SM	L	TB,T	1-3	100	16	3,000	L	1965	Y	PP-ST-C	DK	DK	DK	DK	DK	DK	PNP	W
UNIPAC	SM	L,M,S, SS,VE	K,M	K-12	100	1,000	100,000	M	1968	Y	PP-PT	DK	DK	DK	DK	OY,COY LPMY	DK	PNP	W
University of Illinois Astronomy Program	SM	S	DK	5-10	75	55	6,000	L	1970	Y	DK	DK	DK	DK	DK	DK	DK	G	NE
Variable Modular Scheduling via Computer	O,CO	L,M,S, SS,VE	M,C	K-12	100	200	250,000	M	1967	Y	PP-ST-C	DK	DK	P-PT	DK	COY,OY LPMY	OY,COY LPMY	PNP	W
Vocational Information for Education and Work	SM	VE	F,A,C	9-12	75	26	12,000	H	1967	Y	DK	DK	DK	DK	DK	DK	DK	PPM	SE
World of Language	SM	L	TB,G	K-8	100	100	10,000	L	1970	Y	DK	DK	DK	DK	DK	DK	DK	PPM	NE

APPENDIX F

MASTER OUTLINE FOR PRODUCT DEVELOPMENT REPORTS

Explanation: The headings in the following outline are APA Order Headings. The following is an example of each of the four headings used:

ORIGIN

Key Personnel

Special Qualifications

Relevant experience.

Note: First order heading is centered and in caps; second order heading is centered and underlined; third order heading begins at the left margin and is underlined; and fourth order heading is indented, underlined and followed first by a period (.) and then by the text of the paragraph.

Words in "( )" are not to be included as part of the headings. When words appear in "[ ]", select the appropriate word as part of the heading.

PRODUCT DESCRIPTION

Product Characteristics

Name

Developer

Distributor

Focus

Grade Level

Target Population

Rationale for Product

Long Range Goals of Product

Objectives of Product

Philosophy Behind Product

Theories Supporting Product

Description of Materials

Organization of Materials

Format of Materials (how physically presented)

Content of Materials (concepts and terminology covered, etc.)

Cost of Materials to User

Procedures for Using Product

Learner Activities

- Relationship to program objectives.
- Typical activities in a day.
- Group and individual activities.

Kinds of practice, review and feedback.

Recommended period of use.

Provisions for motivating student.

Teacher Activities

Teacher strategy.

Teacher training.

Out-of-class preparation.

Provisions for Parent/Community Involvement

Special Physical Facilities or Equipment

Recommended Assessment Techniques for Users (e.g., criterion-referenced, tests, etc.)

ORIGINS

Key Personnel

Education and Experience of Key Personnel

Philosophy of Key Personnel

Relevant Research Conducted by Key Personnel

Sources of Ideas for Product

Trends of the Time

Relevant Research

Theory.

Techniques.

Technological Prerequisites

Similar Products

Evolution of Ideas for Product

First Formulation of Ideas for Product (Note when, by whom, why, how, in what form?)

Changes in Ideas for Product (Note when, by whom, why, how, in what form?)

Factors Which Stimulated Development of the Idea

Efforts of a key person or persons.

Available funding.

Need for the product. (Note how need was defined, assessed and documented.)

Potential effectiveness and feasibility of product.

Motivation to produce product.

Funding for Product

Initial Efforts to Fund Products

Contacts with Funding Sources

Factors Influencing Funding Sources

Preparation of Proposals

Details of Funding Agreement

Description of Funding Sources

Breakdown of Funds (by stages of development, categories of use, and/or components)

PRODUCT DEVELOPMENT

Management and Organization

Characteristics of Development Agency (Note major funding source, age, other projects, number and qualifications of staff, organizational structure)

Relationship of This Product to Agency (Note proportion of resources, people and facilities devoted to product)

Other Agencies Involved in Development

Characteristics of other involved agencies.

Relationship to primary developer. (Note division of responsibility, channels of communication, procedures for decision making.)

Original Development Plan

Objectives

Description of Expected Product

Procedures for Product Development

- Organization.
- Tasks.
- Personnel.
- Time schedule.

Planned Procedures for Product Evaluation

- Formative evaluation plans.
- Summative evaluation plans.

Modifications of Original Development Plan

List and Description of Modifications

Reasons for Making Modifications

Brief Comparison of Planned Development with Actual Development

Actual Procedures for Development of Product

(For each stage/phase of development note the following information)

Development Staff (Note size, education, experience, special qualifications, organizational structure, problems in recruiting and maintaining.)

Patterns of Interaction (Note channels of communication between staff, general interpersonal relationships.)

Development

- Activities and tasks.
- Procedures followed. (Note effective and not so effective ones.)
- Bottlenecks and problems.
- Major decisions. (Note procedures for making decisions.)

Formative Evaluation

Conditions of formative evaluation. (Note when, by whom, with whom.)

Procedures followed in formative evaluation.

Techniques used to gather information.

Procedures for modifying product on the basis of formative evaluation results.

Nature and extent of modifications.

Number and description of formative evaluation cycles.

Other Formative Evaluation (Note field tests, for example)

Conditions of evaluation. (Note when, by whom, with whom.)

Procedures followed.

Techniques used to gather information.

Procedures for modifying product on the basis of evaluation results.

Nature and extent of modifications.

Number and description of iterative cycles.

Development of Performance Measures/Assessment Techniques

(For each stage/phase of development note
the following types of information)

Development Staff (Note size, education, experience, special qualifications, organizational structure, problems in recruiting and maintaining)

Patterns of Interaction (Note channels of communication between staff, general interpersonal relationships)

Development

Activities and tasks. (Note research on available techniques, adaption of techniques to product, expansion of techniques.

Procedures followed. (Note effective and not so effective ones.)

Bottlenecks and problems.

Major decisions. (Note procedures for making decisions.)

Formative Evaluation of Assessment Techniques

Conditions of evaluation. (Note when, by whom, with whom.)

Procedures followed.

Techniques used for gathering information.

Procedures for modifying assessment techniques.

Nature and extent of modifications.

Number and description of evaluation cycles.

Other Formative Evaluation of Assessment Techniques (e.g., note field tests, etc.)

Conditions of evaluation. (Note when, by whom, with whom.)

Procedures followed.

Techniques used for gathering information.

Procedures for modifying assessment techniques.

Nature and extent of modifications.

Number and description of evaluation cycles.

SUMMATIVE EVALUATION

Evaluation Staff

Relationship to Development Staff

Size

Education, Experience, Special Qualifications

Hierarchy and Organizational Structure (Note interpersonal relationships)

Problems in Recruiting and Maintaining Staff

Field Tests

(For each field test note the following
types of information)

Designer of Field Test (Note who and when)

Funding

Coordinator of Field Test (Note who, relationship to developing and funding agencies)

Subjects

Number [students, schools, classes or teachers].

Geographical distribution.

Socio-economic description.

Selection process. (Note schools or districts and experimental and control groups)

Treatments

Experimental treatments.

Control treatment.

Measures

Description of measures. (Note standardized tests, staff constructed tests, questionnaires, structured observations, school visits, etc.)

Rationale for measures employed.

Procedures for administration.

Results of Field Test

Analyses used.

Rationale for analyses.

Student cognitive changes.

Student affective changes.

Changes in facilitating factors.

Unanticipated changes.

Documentation and reporting of results.

Modifications Made in Product

Procedures for modifying product on the basis of field test results.

Nature and extent of modifications in product.

Other Summative Evaluations
(e.g., those conducted by the users)

Designer of Evaluation Program (Note who and when)

Funding

Coordinator (Note who, relationship to developing and funding agencies)

Subjects

Number [students, schools, classes or teachers].

Geographical distribution.

Socio-economic description.

Selection process. (Note schools or districts and experimental and control groups.)

Treatments

Experimental treatments.

Control treatments.

Measures

Description of measures. (Note standardized tests, staff constructed tests, questionnaires, structured observations, school visits, etc.)

Rationale for measures employed.

Procedures for administration.

Results of Evaluation

Analyses used.

Rationale for analyses.

Student cognitive changes.

Student affective changes.

Changes in facilitating factors.

Unanticipated changes.

Documentation and reporting of results.

Modifications Made in Product as a Result of Evaluation Results

Comments on the adequacy of the evaluations.

DIFFUSION

Agency Participation

Agencies Involved (Note characteristics)

Relationships Among Agencies

Diffusion Activities of Each Agency (Give brief descriptions)

Diffusion Strategy

Developer of Plans/Strategy

Outline of Strategy

Target.

Techniques for reaching target.

Actual Diffusion Efforts

Activities (list, describe, when, by whom)

Responses to Diffusion Efforts

Indications of interest.

Early users.

Revisions in Diffusion Strategy (Describe and give rationale for making revisions)

Product Characteristics and Other Factors Affecting Diffusion

Complexity of Product

Divisibility of Product

Compatibility of Product with Other School Practices

Teacher Training Required

Ease with Which Product Can be Communicated

Comparison with Other Products

Economic Conditions and Attitudes of the Times

Cost of Product

Start-up costs.

Continuation costs.

Alternative products.

ADOPTION

Extent of Product Use

(Differentiate between field tests, try outs and adoption)

Location of Users (Note geographic distribution)

Number of Users (Note how many students, schools; number of copies sold, etc.)

Socio-Economic Characteristics of Users

Length of Time in Use

Initiation of Adoption

Relationship Between User and Developer and/or Distributor

Installation Procedures

Necessary Physical Arrangements or Equipment

Necessary Classroom Organization

Importance of Teacher Training

Availability of training programs.

Development of training programs.

Description of training programs. (Note length, expense, organization, materials, techniques used.)

Evaluation of effectiveness of training.

Extra Staff Requirements

Supervisory requirements.

Paraprofessional requirements.

Consultants.

Extent of Product Modification Possible

Degree of Administrative Support Needed

Importance of Public Relations Effort Prior to Adoption

Success of Installation Procedures

Favorable and Unfavorable Conditions

Effective and Not So Effective Procedures

Methods for Obtaining Feedback From Users

Available Information From Users

COSTS

Total Cost of Product From Origin Through Adoption

Available Breakdown of Costs

(By stages of development, product components, personnel)

FUTURE OF THE PRODUCT

Expected Use or Impact of Product

Anticipated Revisions of Product

CRITICAL DECISIONS

REFERENCES

APPENDICES

APPENDIX G: DETAILED DESCRIPTION OF THE 21 EXEMPLARY PRODUCTS

	APTP	Cluster Concept	Creative Drug	DEEP	Distar	Facilitating Inquiry	FYCS	Frostig	Hawaii English	Holt Social Studies	IPI-Math	ISCS	MATCH	Project PLAN	S-SAP	SCIS	Sesame Street	Sullivan	Taba Social Studies	Talking Typewriter	Variable Module
1. Type of Developer																					
Regional Laboratory						1	1				1										
R&D Center											1										
University		1			1				1	1		1				1			1		1
Other government, including school districts, state				1					1										1		
Private non-profit				1	1			1					1	1	1		1				
Profit-making	1		1											1				1		1	1
2. Focus of the Product																					
Subject matter	1	1	1	1	1		1		1	1	1	1	1	1	1	1	1	1	1	1	
Organizational efficiency																					1
Classroom climate or operation						1															
Learning procedures or methodology	1			1		1					1	1	1	1						1	
Perceptual-motor skills								1													
3. Grade Level																					
Kindergarten			1	1	1		1	1	1		1				1		1	1		1	1
Grade 1	1		1	1	1	1		1	1		1		1	1	1	1		1	1	1	1
Grade 2	1		1	1	1	1		1	1		1		1	1	1	1		1	1	1	1
Grade 3	1		1	1		1		1	1		1		1	1	1	1		1	1	1	1
Grade 4	1		1	1		1			1		1		1	1	1	1			1		1
Grade 5	1		1	1		1			1		1		1	1	1	1			1		1
Grade 6	1		1	1		1			1		1		1	1	1	1			1		1
Grade 7	1		1	1		1			1			1		1					1		1
Grade 8	1		1	1		1			1			1		1					1		1
Grade 9			1	1		1			1	1		1		1							1
Grade 10				1		1			1	1				1							1
Grade 11		1		1		1			1	1				1							1
Grade 12		1		1		1			1	1				1							1
4. Percentage of Target Population at the Intended Grade Level	100	40	100	100	100	100	100	100	100	75	100	100	100	100	100	100	100	100	100	100	100
5. Extent to Which Objectives For Student Performance Were Specified																					
Very general objectives																					
General objectives			1					1													1
Somewhat specific				1		1						1	1								
Specific objectives					1				1	1						1	1			1	
Very specific objectives	1	1					1				1			1	1			1	1		

	APTP	Cluster Concept	Creative Drug	DEEP	Distar	Facilitating Inquiry	FYCS	Frostig	Hawaii English	Holt Social Studies	IPI-Math	ISCS	MATCH	Project PLAN	S-SAP	SCIS	Sesame Street	Sullivan	Taba Social Studies	Talking Typewriter	Variable Module
6. Type of Format As Used in Schools																					
Textbooks			1	1	1				1	1		1			1			1			
Workbooks	1			1	1		1	1	1	1	1	1	1	1	1	1		1		1	
Manuals or guides	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1		1
Television																	1				
Films (slides, strips, movie)			1	1	1				1	1		1	1							1	
Audio equipment (records, tapes)			1	1	1				1	1	1		1	1				1		1	
Displays (charts, maps, models)	1		1	1	1			1	1	1			1	1	1	1		1			
Games							1	1	1	1			1	1				1			
Computer	1													1						1	
Laboratory equipment						1			1			1			1	1					
Tests	1			1	1		1	1	1	1	1	1		1	1	1		1	1	1	
Type of Format As Used in Training Personnel																					
Textbooks				1					1			1									
Workbooks				1		1	1	1			1	1			1				1		
Manuals or guides	1	1		1	1	1	1	1		1	1		1	1	1	1	1	1	1	1	1
Television				1																	
Films (slides, strips, movie)				1	1		1	1	1	1	1			1	1			1	1		
Audio equipment (records, tapes)						1	1		1		1			1				1	1		
Displays (charts, maps, models)								1						1	1						
Games						1												1			
Computer														1							
Laboratory equipment															1						
Tests				1		1					1	1		1	1						
8. Type of Content																					
Language					1		1	1	1					1			1	1		1	
Mathematics	1				1			1			1			1			1				
Science								1				1		1	1	1					
Social Studies			1	1				1		1			1	1					1		
Vocational Education		1		1																	
9. Cost of Product Per Student Per Year ($)	NI	NI	3	NI	30	1	3	5	40	4	8	8	1	100	4	5	1	20	NI	200	5

NI = No Information

	APTP	Cluster Concept	Creative Drug	DEEP	Distar	Facilitating Inquiry	FYCS	Frostig	Hawaii English	Holt Social Studies	IPI-Math	ISCS	MATCH	Project PLAN	S-SAP	SCIS	Sesame Street	Sullivan	Taba Social Studies	Talking Typewriter	Variable Module
10. Period of Student Use																					
Continuous use (hours in a semester)	0	180	20	NA	135	NA	35	40	90	80	90	35	45	500	45	27	120	95	35	0	NA
Non-continuous use (total hours)	7	0	0	NA	0	NA	0	0	0	0	0	0	0	0	0	0	0	0	0	13	NA
11. Provision for Parent-Community Involvement																					
No provision						1		1	1	1		1	1		1	1			1		
Few provisions	1		1		1						1			1				1			1
Some provisions		1																			
Many provisions				1			1										1			1	
Extensive provisions																					
12. Degree of Specificity of Assessment Measures																					
None			1																		1
Little													1								
Some				1				1		1		1				1				1	
Much					1	1			1								1		1		
Very much	1	1					1				1			1	1			1			
13. Number of Key Development Staff	4	3	1	4	7	6	6	5	16	4	12	6	2	8	5	3	12	3	6	2	6
14. Number of Key Development Staff With Doctorates	1	2	0	3	4	3	6	2	12	2	12	6	0	7	5	2	1	2	3	1	4
15. Years of Professional Experience of Key Development Staff																					
0-3	NI	1		NI	NI	2	NI	NI	NI		NI	NI	NI	NI	NI	NI			NI		NI
4-6	NI		1	NI	NI	1	NI	NI	NI	2	NI	NI	NI	NI	NI	NI	4		NI		NI
7-9	NI			NI	NI	1	NI	NI	NI	1	NI	NI	NI	NI	NI	NI	4	1	NI		NI
10 or more years	NI	2		NI	NI	2	NI	NI	NI	1	NI	NI	NI	NI	NI	NI	4	2	NI	2	NI
16. Key Staff Specialization																					
Teachers	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
College faculty members	0	3	0	0	1	0	0	1	8	2	10	5	0	0	4	2	0	3	4	0	4
Administrators	0	0	0	1	1	1	1	1	8	1	0	1	0	1	0	1	1	0	0	0	0
R&D personnel	4	0	1	3	5	4	5	3	0	1	2	0	2	7	1	0	11	0	0	2	2

NA = Not Applicable; NI = No Information

	APTP	Cluster Concept	Creative Drug	DEEP	Distar	Facilitating Inquiry	FYCS	Frostig	Hawaii English	Holt Social Studies	IPI-Math	ISCS	MATCH	Project PLAN	S-SAP	SCIS	Sesame Street	Sullivan	Taba Social Studies	Talking Typewriter	Variable Module
17. User Needs For Product Were Determined by:																					
Educated guess based on past experience	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Asking knowledgeable people or literature review	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1		1		1
Observation of user sample					1	1		1	1							1	1	1	1		1
Performance measures								1	1					1		1	1				
18. Type of Funding Sources for Product Development																					
Government		1			1	1	1		1	1	1	1	1	1	1	1	1	1	1		1
Private	1		1	1	1			1			1			1			1	1		1	1
19. Cost for Total Development of Product (in million dollars)	NI	NI	NI	NI	NI	NI	NI	NI	4.25	NI	NI	NI	NI	6.00	2.00	3.20	8.00	3.00	NI	NI	NI
20. Diffusion Cost As Part of the Original Development (in million dollars)	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	3.0	NI	0.6	NI	NI	NI	NI	NI
21. Total Cost To Get Product From Origin to User (in million dollars)	1.0	0.3	0.1	4.0	NI	0.1	2.0	NI	5.0	0.4	NI	3.0	0.5	9.0	2.3	4.0	14.0	5.0	1.0	3.0	1.5
22. Number of Organizations Who Participated in Development																					
1	1	1	1			1	1	1		1		1	1		1	1	1				
2					1				1		1			1					1	1	1
3																		1			
4				1																	
23. Stage at Which Formative Evaluation Was Initiated																					
Very late																					
Late		1																			
Mid-point	1		1																		1
Early				1		1	1		1			1	1	1	1		1			1	
Very early					1			1		1	1					1		1	1		
24. Number of Major Formative Evaluation Cycles																					
1	1		1										1	1			1			1	
2		1			1													1	1		
3				1					1		1	1	-	-	1	1					
4 or more						1	1	1		1											1

NI = No Information

	APTP	Cluster Concept	Creative Drug	DEEP	Distar	Facilitating Inquiry	FYCS	Frostig	Hawaii English	Holt Social Studies	IPI-Math	ISCS	MATCH	Project PLAN	S-SAP	SCIS	Sesame Street	Sullivan	Taba Social Studies	Talking Typewriter	Variable Module
25. Procedures Used For First Cycle of Formative Evaluation																					
Development staff taught			1	1	1	1	1	1	1		1					1					
Asked classroom teacher	1	1		1	1	1		1	1	1	1	1	1	1	1	1		1	1		1
Development staff observed in use	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1
Obtained performance measures	1	1			1	1	1	1	1		1	1		1	1	1	1	1			
26. Product Modification As Result of First Cycle of Formative Evaluation																					
Not at all																					
Only a little						1															
Some	1	1												1							
Much			1	1	1																
Very much							1	1	1	1	1	1	1		1	1	1	1	1	1	1
27. Number of Large-and Small-Scale Field Tests (see text)	1	0	0	3	6	1	1	NI	2	0	1	0	1	2	3	5	2	5	1	2	0
Funding Sources For Major Field Test																					
Regional Laboratory		NA	NA			1	1	NI		NA	1	NA			1	NI					NA
R&D Center		NA	NA					NI		NA		NA				NI					NA
University		NA	NA					NI	1	NA		NA				NI			1		NA
Other government, including school districts, states		NA	NA	1	1	1		NI	1	NA		NA	1	1		NI	1	1	1	1	NA
Private non-profit		NA	NA	1				NI		NA		NA		1		NI	1				NA
Profit-making	1	NA	NA		1			NI		NA		NA		1		NI		1			NA
Number of Organizations Which Participated in Major Field Test	1	NA	NA	1	1	1	1	NI	2	NA	1	NA	1	2	1	NI	2	1	1	1	NA
Number of Field Test Staff in Major Field Test	4	NA	NA	NI	NI	4	NI	NI	NI	NA	NI	NA	NI	NI	NI	NI	NI	NI	4	NI	NA
Product Modification As Result of Major Field Test																					
Not at all		NA	NA					NI		NA		NA				1				NI	NA
Only a little	1	NA	NA	1		1	1	NI		NA		NA		1	1			1		NI	NA
Somewhat		NA	NA		1			NI	1	NA	1	NA					1			NI	NA
Much		NA	NA					NI		NA		NA	1						1	NI	NA
Very much		NA	NA					NI		NA		NA								NI	NA

NA = Not Applicable; NI = No Information

	APTP	Cluster Concept	Creative Drug	DEEP	Distar	Facilitating Inquiry	FYCS	Frostig	Hawaii English	Holt Social Studies	IPI-Math	ISCS	MATCH	Project PLAN	S-SAP	SCIS	Sesame Street	Sullivan	Taba Social Studies	Talking Typewriter	Variable Module
Cost of Major Field Test (in thousand dollars)	NI	NA	NA	NI	NI	NI	NI	NI	750	NA	NI	NA	NI	NI	NI	NI	NI	NI	NI	NI	NA
28. Number of Students in All Field Tests	15	NA	NA	6000	1000	143	30	NI	4000	NA	NI	NA	1800	7500	28K	NI	1000	3400	300	NI	NA
29. Number of Schools Participating in All Field Tests	1	NA	NA	NI	NI	6	1	NI	40	NA	15	NA	NI	35	21	NI	NI	NI	7	NI	NA
30. Geographical Extent of All Field Tests (Number of states)	1	NA	NA	3	4	4	1	NI	1	NA	3	NA		11	NI	NI	7	4	2	1	NA
31. Number of Reported Studies on Product Effectiveness During Product Development (see text)																					
Cognitive gains: Positive	0	0	0	0	2	0	1	0	0	1	0	1	0	0	1	0	0	1	0	1	0
Mixed	1	2	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0
Negative	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Affective gains: Positive	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Mixed	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Negative	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Facilitating effects: Positive	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Mixed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Negative	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32. Number of Reported Large-Scale Summative Evaluation Studies (see text)																					
Cognitive gains: Positive	0	0	0	1	2	0	0	NI	1	0	0	0	0	0	3	0	1	3	0	1	0
Mixed	0	0	0	0	1	0	0	NI	1	0	1	0	0	1	0	0	0	1	1	1	0
Negative	0	0	0	1	0	0	0	NI	0	0	0	0	0	0	0	0	0	0	0	0	0
Affective gains: Positive	0	0	0	0	0	0	0	NI	0	0	1	0	1	0	0	0	0	0	1	0	0
Mixed	0	0	0	0	0	0	0	NI	0	0	0	0	0	0	0	0	0	0	0	0	0
Negative	0	0	0	0	0	0	0	NI	0	0	0	0	0	0	0	0	0	0	0	0	0
Facilitating effects: Positive	0	0	0	0	0	1	0	NI	0	0	0	0	0	0	0	0	0	0	0	0	0
Mixed	0	0	0	0	0	0	0	NI	0	0	0	0	0	0	0	0	0	0	0	0	0
Negative	0	0	0	0	0	0	0	NI	0	0	0	0	0	0	0	0	0	0	0	0	0

NA - Not Applicable; NI = No Information

	APTP	Cluster Concept	Creative Drug	DEEP	Distar	Facilitating Inquiry	FYCS	Frostig	Hawaii English	Holt Social Studies	IPI-Math	ISCS	MATCH	Project PLAN	S-SAP	SCIS	Sesame Street	Sullivan	Taba Social Studies	Talking Typewriter	Variable Module
33. Number of Reported Small-Scale Studies on Product Effectiveness After Product Development (see text)																					
Cognitive gains: Positive	1	0	0	0	2	0	0	NI	0	0	0	0	0	0	0	2	0	0	0	0	0
Mixed	0	0	0	0	0	0	1	NI	0	0	0	0	0	0	0	0	0	0	0	0	0
Negative	0	0	0	1	1	0	0	NI	0	0	0	0	0	0	0	1	1	0	0	0	0
Affective gains: Positive	0	0	0	0	0	0	0	NI	0	0	0	0	0	1	0	2	0	0	0	0	0
Mixed	0	0	0	0	0	0	0	NI	0	0	0	0	0	0	0	0	0	0	0	0	0
Negative	0	0	0	0	0	0	0	NI	0	0	0	0	0	0	0	0	0	0	0	0	0
Facilitating effects:																					
Positive	0	0	0	0	0	0	0	NI	0	0	0	0	0	0	0	0	0	0	0	0	0
Mixed	0	0	0	0	0	0	0	NI	0	0	0	0	0	0	0	0	0	0	0	0	0
Negative	0	0	0	0	0	0	0	NI	0	0	0	0	0	0	0	0	0	0	0	0	0
34. Type of Disseminator																					
Regional Laboratory					1	1				1											
R&D Center																					
University										1		1				1					
Other government, including school districts, state									1												
Private non-profit				1	1			1					1				1				
Profit-making	1		1	1	1			1		1		1	1	1	1	1		1	1	1	1
35. Marketer or Distributor																					
Regional Laboratory							1				1										
R&D Center																					
University																					
Other government, including school districts, state									1												
Private non-profit				1													1				
Profit-making	1		1	1	1	1		1		1	1	1	1	1	1	1	1	1	1	1	1
36. Primary Developer Is Currently:																					
Disseminating	1		1	1	1	1	1	1	1	1	1	1	1			1	1	1		1	1
Marketing	1		1	1			1		1		1						1	1		1	1

NI = No Information

	APTP	Cluster Concept	Creative Drug	DEEP	Distar	Facilitating Inquiry	FYCS	Frostig	Hawaii English	Holt Social Studies	IPI-Math	ISCS	MATCH	Project PLAN	S-SAP	SCIS	Sesame Street	Sullivan	Taba Social Studies	Talking Typewriter	Variable Modula
37. Diffusion Technique Used: Tell (written or oral)																					
Not used																					
Used very late																					
Used late		1																			
Used midway	1												1			1		1			1
Used early			1	1	1	1	1	1	1								1		1		
Used very early										1	1	1		1	1					1	
Diffusion Technique Used: Show (demonstrations)																					
Not used		1																			
Used very late																					
Used late													1							1	
Used midway	1								1	1		1				1		1			1
Used early			1	1	1	1	1	1						1			1		1		
Used very early											1				1						
Diffusion Technique Used: Involve (participating in development)																					
Not used	1	1	1		1													1		1	1
Used very late																					
Used late																					
Used midway																1					
Used early						1	1	1	1		1		1				1				
Used very early				1						1		1		1	1				1		
Diffusion Technique Used: Train (workshops or training program)																					
Not used	1	1																		1	1
Used very late																					
Used late			1				1						1					1			
Used midway								1	1	1	1					1	1				
Used early				1	1	1						1		1					1		
Used very early															1						1
Diffusion Technique Used: Intervene (imposed from top)																					
Not used																					
Used very late																					
Used late		1																			
Used midway	1												1			1		1			1
Used early			1	1	1	1	1	1	1								1		1		
Used very early										1	1	1		1	1					1	

	APTP	Cluster Concept	Creative Drug	DEEP	Distar	Facilitating Inquiry	FYCS	Frostig	Hawaii English	Holt Social Studies	IPI-Math	ISCS	MATCH	Project PLAN	S-SAP	SCIS	Sesame Street	Sullivan	Taba Social Studies	Talking Typewriter	Variable Module
38. Divisibility of Product																					
Parts of product can be used independently	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1		
Parts of product can be purchased independently	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1		1	1		
39. Compatibility With Other School Practices																					
Very incompatible		1												1							1
Incompatible									1		1										
Compatible	1			1	1	1							1		1	1	1	1	1	1	
Very compatible			1				1	1		1		1									
40. Degree of Change Required on Affective Level																					
None																	1				
Little			1	1	1	1	1	1		1			1		1	1			1		
Some	1								1			1						1		1	
Much		1																			
Very much											1			1							1
41. Number of Available Competitive Alternatives																					
No other alternatives		1		1					1			1	1				1			1	
1-2 alternatives	1					1		1						1		1					1
3-5 alternatives			1		1		1			1	1				1				1		
6-9 alternatives																		1			
10 or more alternatives																					
42. Number of Schools in Which Product Is Used	8	NI	248	NI	3000	NI	NI	NI	160	NI	300	NI	NI	53	NI	2500	NI	35K	NI	NI	150
43. Number of Students Using Product (in thousands)	NI	NI	7	7000	150	NI	33	200	26	500	NI	200	50	20	NI	1000	5000	5000	1000	NI	150
44. Number of States Where Product Currently Used	3	NI	31	37	NI	5	4	40	1	35	30	50	NI	12	NI	40	50	50	NI	13	NI
45. Need For Classroom Modifications			1				1														
None needed				1	1	1		1		1		1	1		1	1	1	1	1	1	
Few needed	1								1												
Some needed		1									1										1
Many needed														1							
Very many needed																					

NI = No Information

	APTP	Cluster Concept	Creative Drug	DEEP	Distar	Facilitating Inquiry	FYCS	Frostig	Hawaii English	Holt Social Studies	IPI-Math	ISCS	MATCH	Project PLAN	S-SAP	SCIS	Sesame Street	Sullivan	Taba Social Studies	Talking Typewriter	Variable Module
46. Need for Special Facilities and Equipment	1	1												1			1			1	
47. Extent of Product Modification Allowed For User To Make																					
None					1				1								1				
Little		1	1				1	1		1	1	1	1	1	1						
Some	1															1		1	1	1	
Much				1																	1
Very Much						1															
48. Need for Special Teacher Training																					
None																					
Little	1												1				1				1
Some		1	1				1			1		1			1					1	
Much				1	1											1		1			
Very much						1		1	1		1			1					1		
49. Special Teacher Training Provided by Developer																					
No provision																					
Little provision	1		1										1								1
Some provision		1			1				1	1		1		1	1	1	1		1	1	
Much provision				1			1	1										1			
Complete provision						1					1										
50. Extra Staff Requirements																					
Supervision	1			1										1						1	
Paraprofessional	1				1						1						1			1	
Additional teachers									1											1	
Consultants				1		1										1				1	
51. Degree of Administrative Support Needed For Successful Adoption																					
None																					
Little						1		1		1	1	1	1				1		1		
Some			1		1		1		1						1	1		1			
Much	1	1		1																	
Very much														1						1	1

	APTP	Cluster Concept	Creative Drug	DEEP	Distar	Facilitating Inquiry	FYCS	Frostig	Hawaii English	Holt Social Studies	IPI-Math	ISCS	MATCH	Project PLAN	S-SAP	SCIS	Sesame Street	Sullivan	Taba Social Studies	Talking Typewriter	Variable Module
52. Importance of Public Relations Prior to Adoption																					
Minimally important						1				1			1		1	1					
Important	1	1	1	1	1		1	1				1		1			1	1	1		
Critical									1		1									1	1
53. Methods For Obtaining Feedback From Users																					
Informal collection of information	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1
Systematic sampling						1	1		1			1					1				
Survey of all users									1												
54. Amount of Expected Use by 1973 (in thousands)	NI	NI	NI	NI	500	NI	1000	300	200	NI	NI	500	NI	30	NI	2000	9000	9000	NI	NI	300

NI = No Information

APPENDIX H

LIST OF PRODUCT DEVELOPMENT REPORTS PREPARED SEPARATELY

The following Product Development Reports have been distributed separately. Copies may be obtained through ERIC or from the American Institutes for Research, Palo Alto, California.

No. 1: First Year Communication Skills Program, 62 pages

No. 2: Hawaii English Program, 81 pages

No. 3: Intermediate Science Curriculum Study, 47 pages

No. 4: Science Curriculum Improvement Study, 48 pages

No. 5: The Sullivan Reading Program, 70 pages

No. 6: The Creative Learning Group Drug Education Program, 52 pages

No. 7: The Frostig Program for Perceptual-Motor Development, 64 pages

No. 8: Science--A Process Approach, 52 pages

No. 9: Variable Modular Scheduling Via Computer, 96 pages

No. 10: Sesame Street, 51 pages

No. 11: Arithmetic Proficiency Training Program, 49 pages

No. 12: The Edison Responsive Environment Learning System or The Talking Typewriter, 33 pages

No. 13: Holt Social Studies Curriculum, 66 pages

No. 14: Distar Instructional System, 69 pages

No. 15: Materials and Activities for Teachers and Children--The MATCH Program, 59 pages

No. 16: Developmental Economic Education Program (DEEP), 52 pages

No. 17: Individually Prescribed Instruction--Mathematics (IPI-Math), 48 pages

No. 18: The Cluster Concept Program, 69 pages

No. 19: The Taba Social Studies Curriculum, 79 pages

No. 20: Facilitating Inquiry in the Classroom, 38 pages

No. 21: Program for Learning in Accordance With Needs (PLAN), 84 pages